

# Personality and serendipity: Curiosity, capability and happy accidents

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“Chance favours only the prepared mind”

Louis Pasteur

French microbiologist and chemist

Lecture, University of Lille

7 December 1854

# 1 ABSTRACT

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This study of serendipity aims to investigate why and how some people experience serendipity more than others. For if we understand how people find information, we as information professionals will better know how to help them. It seeks to identify:

- what the concept means to researchers and those who experience serendipity;
- whether the description of serendipity in the literature is consistent with how it is described in real life;
- why some people experience serendipity more often than others;
- why people think it happens;
- why serendipity is not always remembered;
- whether serendipity is accidental or is something that can be learnt;
- what characteristics and personality traits are associated with serendipity in the literature and whether there is evidence to support the impact of these traits on serendipity;
- whether there are particular trends across different subjects and levels of study;
- how people come across information serendipitously, particularly the role of motivation, preferred learning style and use of a search strategy;
- how people find information by accident in this digital age;
- whether a library can facilitate serendipity and what libraries and information services could do to help users find information unexpectedly;
- whether it is felt that there is a stigma attached to finding information serendipitously;
- and to relate the findings of this study to the wider body of work on serendipity.

A naturalistic methodological approach was undertaken, gathering 48 responses to an online questionnaire and eight semi-structured face-to-face or Skype interviews.

The study found that serendipity:

- Is seen both in the literature and in reality as a pleasing, surprising and positive experience;
- Can be linked to extroversion, agreeableness, having time to search and invest in what is being read, enjoying the information searching process, skim-reading, searching for inspiration and new ideas, not using the first information found to save time and not searching for information for a purpose;
- Happens when people are in good and bad moods;
- Is considered to be linked to a slow, inquisitive approach to life;
- Is more likely to be recalled if it happens frequently, but is also easily forgotten;
- Is seen as something one could train oneself towards, but not something that can be directly sought;

- Could be sought subconsciously, as results suggest people are looking for something;
- Is experienced less frequently by those who enjoy learning by doing or by those who prefer group work;
- Is not linked to search strategy;
- Does not conclusively increase in frequency with academic level
- Is not conclusively linked to subject studied;
- Can still happen in the digital age, with most thinking highly of the internet's role in serendipity and some still coming across information via traditional methods such as browsing bookshelves;
- Can be facilitated by a library or information service, but the idea that serendipity is more likely to happen in a library remains inconclusive;
- Is not universally respected in academia.

## **KEY WORDS**

Serendipity, accidental information discovery, personality, aptitude, capability, curiosity, five-factor model, information literacy, information seeking, information behaviour, browsing, digital age, libraries, information environment, stigma.

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## 2.3 ABBREVIATIONS

Serendipity is known by other terms:

IE = information encountering (coined by Erdelez)

IIA = incidental information acquisition (coined by Heinström).

## 2.4 ACKNOWLEDGEMENTS

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### 3 INTRODUCTION

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#### 3.1 BACKGROUND

##### 3.1.1 Definitions and descriptions

unexpectedness  
 stumbled upon  
 while looking for something else  
 non-search too good to be true  
 windfall fortuitous light bulb  
 unexpected joy information finds you  
 out of the blue fate destiny  
 lucky strike eureka moment gift surprise  
 slightly random encounter value  
 magic information encountering  
 whoa chance discovery connection  
 insight elusive spark  
 noticed happy accident walked into  
 bumped into  
 preoccupation planned chaos  
 missed opportunity  
 unpredictable

Just that slightly random encounter, destiny, fate (Makri and Blandford, 2012a)	spark, lucky strike (McCay-Peet and Toms, 2010)
elusive, unpredictable, random, chance, happy accident, fortuitous (Foster and Ford, 2003)	preoccupation, unexpectedness, insight, value, stumbled upon, surprise; bumped into; while looking for something else, noticed, whoa (Bjorneborn, 2013)
gift, non-search (Anciaux, 1994)	too good to be true (Winchester, 2010)
information finds you (McBirnie, 2008)	eureka moment (Rubin, 2010 and Bawden, 2011);
windfall (George, 2009)	planned chaos (Hoeflich, 2007)
magic (Leong 2007 and Hoeflich 2007)	information encountering (Erdelez, 2004)
missed opportunity (Van Andel, 1994)	light bulb, connection, out of the blue (Rubin, 2010)

*Figure 1 Words used to describe serendipity*

People like the word serendipity. It was once voted the UK's favourite word (BBC, 2000). However, few have attempted to describe serendipity (Merton and Barber, 2004), instead using it to name plays, soaps, restaurants, homes, desserts, businesses and musical groups. This explains McCay-Peet and Toms' (2015) view that serendipity's "meaning has been stretched to apply to experiences ranging from the mundane to the exceptional" (p. 1). A lack of understanding is easily forgiven: serendipity is widely considered to be a term which is extremely difficult to define because it is "inherently subjective" (Makri and Blandford, 2012b, p. 716; Leong, 2007, p. 1), unpredictable and surprising (Heinström, 2010). However, although serendipity is an extremely personal and individual experience, there are remarkable similarities in the way it is defined and described. Serendipity is defined in the Oxford English Dictionary (2015) as "the faculty of making happy and unexpected discoveries by accident". Other dictionaries define the term in similar ways: they describe serendipity as a gift for finding something not sought for or found when looking for another.<sup>1</sup> "Serendipity is commonly used in reference to 'the happy accident' (Ferguson, 1999; Kahn, 1999; Foster and Ford, 2003; Hoeflich, 2007), the finding of things without seeking them (Austin, 1978; Shulman, 2004; Cunha, 2010; Erdelez and Makri, 2011), and as synonymous with 'any pleasant surprise' (Tolson, 2004)" (De Rond, 2005, p. 3). "The experience is often...regarded as a product of chance and luck" (Leong, 2007, p. 1) and of finding the "unexpected" (McBirnie, 2008, p. 604); "something we are not looking for and did not expect to find" (Makri and Blandford, 2011) which "stops us in our tracks" (McCay-Peet, Toms and Kelloway, 2015). This paper works from an understanding of serendipity as the act of discovering something fortuitous by accident, when one is not actively seeking the particular discovery.

### 3.1.2 Etymology

"What is curious is that using serendipity as synonymous with luck seems far removed from its etymology" (Morley and De Rond, 2010, p. 3). "The word 'serendipity' was coined and defined on 28 January 1754 by Horace Walpole...in one of his eighteen hundred letters to [his friend and distant cousin (Morley and De Rond,

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<sup>1</sup> See tables starting at p. 247 of Merton and Barber, 2004 for the complete list of definitions. See also chapter 6 of Merton and Barber's text for a more detailed account of serendipity's origins and definitions than there is space to do here.

2010 p. 5)] Horace Mann” (Van Andel, 1994, p. 633), where he attributed the word serendipity to:

A silly fairy tale, called the three Princes of Serendip: as their Highnesses travelled, they were always making discoveries, by accidents and sagacity<sup>2</sup> of things which they were not in quest of: now do you understand *Serendipity*? ... You must observe that no discovery of a thing you are looking for comes under this description.

(Quoted in Merton and Barber, 2004, p. 2 with Walpole’s own underlinings).

The three princes of Serendip “went on a journey to distant lands in search of a secret poem which would pacify a band of threatening dragons. While travelling, the princes discovered by accident and cleverness, fantastic things that led to unexpected insights” (Knudsen and Lemmergaard, 2013, p. 394). However, the plot of *The Three Princes of Serendip* “scarcely resembles Walpole’s account of it...the three princes in the tale found nothing at all, but merely gave repeated evidence of their powers of observation” (Merton and Barber, 2004, p. 2) (see Appendix 1).

## 3.2 THIS INVESTIGATION

### 3.2.1 Personality and aptitude

Some people seem to have a particular aptitude for serendipitous discovery (to be “serendipity-prone” (Merton and Barber, 2004)) and have “the knack of finding the happy accident” (Hoeflich, 2007, p. 813). As Heinström (2010) argues:

Information-literacy skills may be acquired, but the attitude, willingness and ability to adapt may come more naturally for some than for others. It is therefore plausible that certain persons have an inborn aptitude to handle the changing demands [of finding information] with less effort than others (p. 1).

It is claimed that these are people with “open minds...that allow them both to recognize the fortuitous discovery and to pursue it to its logical end” (Hoeflich, 2007, p. 813), that they have the “capability...to make something good of the unknown” (Cunha, 2010, p. 320) and are “perceptive, curious, intuitive” (Cunha, 2010, p. 325), highly motivated, extroverted, spontaneous and energetic (Heinström, 2010). Heinström (2006) argues that serendipity is avoided by those suffering from “low motivation, stress and insecurity” (p. 579) and those who are anxious, inflexible or intolerant of ambiguity (Heinström, 2010). This paper will investigate what particular

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<sup>2</sup> a special aptitude to make discoveries

characteristics are linked to frequent experiences of serendipity and see whether its findings confirm, contradict or expand existing ideas on the subject.

### 3.2.2 Accident or Capability?

If we looked closely, we would probably find that most things “had an accidental beginning” (Jevons, 1874, p. 531). Bernard (1865) assures us that “chance, with the help of some causal observation...is really the simplest way of beginning a piece of scientific work” and that it is “common [to] pursue what happens to present itself to our eyes” (p. 151). But it still seems curious that scientists refer so much to luck as if “they’d rather be lucky than good” (Werth, 1994, p. 210). The public like to think that discoveries are made accidentally: it “appeals to the popular imagination” (Merton and Barber, 2004, p. 168). However, “there is much more to invention than the popular notion of a bolt out of the blue” (Foster and Ellis, 2014, p. 1016). Whewell (1847) believed strongly that the “intellectual processes” involved in making a great discovery meant that “no scientific discovery can, with any justice, be considered due to accident” (vol. 2, p. 23). Burke suggests that scientists stumble upon something unexpected and inexplicable from time to time, but it is the scientist’s *experience* of scientific work that gives him/her a clue to the value of what has happened (Krotoski, 2013, 13 mins). The Journal of the American Medical Association proposes that it is:

People who do not understand (or entirely like) science [who believe] that everything important has come about through sheerest accident...they imply that if they had been there under a tree when the apple fell, they would have done at least as well as Newton” (in Merton and Barber, 2004, p. 169).

So is serendipity accidental or does it occur, as these academics suggest, because the individual had the capability to pay attention and notice the unusual?

### 3.2.3 Browsing in the digital age

Browsing has been proved “time and time again” in studies “to be the main method of obtaining information” (Nicholas et al, 2004, p. 36). Yet browsing does not always have a positive image. “If users were found to be browsing to any great extent, then this was a reflection on the library and its staff. Either its catalogues and indexes were inadequate, or the users had not been properly instructed in their use” (Bawden, 2011, pp. 1-2). Urquhart (1976) has questioned whether browsing is “really a sensible activity in a research library” (p. 9). Browsing has been considered as



something which is only possible with books and other “printed materials” (Bawden, 2011, p. 2). But with today’s technology, “we leave little up to chance [and] seek out the specific” (Danzico, 2010, p. 16). This means “people may be less exposed to chance or less inclined to try new things” (Danzico, 2010, p. 16). Is serendipity still possible using digital technology? We cannot browse bookshelves as we used to: information is no longer solely available in paper form, but available at the click of a button. Does it matter if seekers did not use the catalogue to find the information? Do people still encounter information serendipitously through browsing? Or is this something we have lost in the digital age?

### **3.2.4 Other considerations**

In addition, this investigation centres on the issues surrounding serendipity that have been highlighted in the literature as areas for further research. It will contribute to and hopefully extend our understanding of this difficult concept (Foster and Ford, 2003). It will “embrace rather than ignore the slippery nature of the phenomenon – and focus on gaining a broad, but detailed understanding of it rather than trying to pin it down” (Makri and Blandford, 2012b, p. 704). It will provide an interdisciplinary approach, as called for by Spink and Currier (2006) and echoed by McBirnie (2008). The study will aim to provide a “better understanding of the subjective nature of serendipity – for example, the relationship between it and related concepts such as chance and fate and peoples’ perceptions of what makes some of their experiences more serendipitous than others” (Makri & Blandford, 2012b, p. 722). It will “examine how other people’s interpretations of serendipitous experiences change over time” (Makri and Blandford, 2012b, p. 704). In adapting and adding to the questions used in Heinstrom (2002) and Sun, Sharples, and Makri, S. (2011) it will be possible to compare the results to that of the literature and hopefully “produce some interesting comparisons” (McBirnie, 2008, p. 613). Primarily, the study hopes to discover “a better understanding of the types of individual differences that lend themselves to openness to serendipitous discovery” (McCay-Peet and Toms, 2009, p. 200).

### 3.3 AIMS AND RESEARCH QUESTIONS

#### Research aim

The aim of this investigation is to examine why and how some people experience serendipity more than others. For if we understand how people find information, we as information professionals will better know how to help them.

#### Research questions

1. Is the description of serendipity in the literature consistent with how it is described in real life?
2. Why do some people experience serendipity more often than others? Where does the 'knack' for accidental discovery come from?
  - a. Is there a link between personality and information seeking behaviour? Does an individual with a curious personality and an extroverted nature, who is in a good mood, reads for pleasure, is of a high intellectual ability and education level, with time to spare, good research skills and access to information experience serendipity more often than those without these attributes?
  - b. Why do people think it happens?
  - c. Why is serendipity not always remembered?
  - d. Is serendipity something that can be learnt?
3. How do people come across information serendipitously?
  - a. Does a desire for serendipity motivate people to find information?
  - b. Does a preference for a particular learning style make you 'serendipity-prone' (Merton and Barber, 2004)?
  - c. Is serendipity more likely to occur with or without a search strategy?
4. Does finding information by browsing still happen or are people more likely, in this digital age, to experience serendipity through digital media than through traditional methods of information seeking?
  - a. What methods of searching for information lead to serendipity?
  - b. Are there any trends depending on the subject and/or level of study?

5. Can a library facilitate serendipity? Is there anything a library or information service could do to help users find information in this way?
  - a. Is serendipity more likely to occur in an information-rich environment, such as the library or the internet?
6. Is there still a stigma around finding information by accident? Are people embarrassed by serendipity (Liestman, 1992)? Why?

## 4 LITERATURE REVIEW

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“Discovery consists in seeing what everybody else has seen, but thinking what nobody else has thought”

Szent-Györgyi, who discovered vitamin C

(De Rond, 2005, p. 3).

### 4.1 HOW IS SERENDIPITY DESCRIBED IN THE LITERATURE? WHAT IS SERENDIPITY?

There is no conclusive agreement on what constitutes serendipity. Scholars have developed various categories and models to try to provide some structure to our understanding of this difficult concept.

- Palmer’s (1991) non-seekers, rangers, seekers, collectors and hunters.
- Erdelez’s (1999) non-encounters, who struggle to identify any information encountering experience; occasional encounterers, who have encounters but just see them as a “lucky incident”; encounterers, who “recognise that they often bump into information”; and super-encounterers, who “encounter information on a regular basis” and see it as an “important part of their information acquisition” (p. 26).
- Austin’s (1978) four kinds of chance (blind luck, happy accident, prepared mind and favouring the individual).
- Van Andel’s (1994) seventeen serendipity patterns (including analogy, one surprising observation, testing a popular belief, successful error, joke, dream) and three appearances of serendipity (positive serendipity (seized opportunity), negative serendipity (missed opportunity) and pseudoserendipity (“finding something that was sought in an unexpected manner” (McCay-Peet and Tom, 2015, p. 2)).
- Cunha’s bisociation (2005), the capacity to combine previously unrelated information (Koestler, 1964).
- Liestman’s (1992) six approaches to serendipity (coincidence, prevenient grace, synchronicity, perseverance, altamirage (ability and personality) and sagacity).
- Merton’s (2004) serendipity pattern, which involves observing, recognising and using an unsought finding.

- Makri and Blandford's (2012b) "multi-dimensional conceptual space[: the] 'serendipity space'" (p. 714).
- Foster's nonlinear model of information seeking (2004) (revised in 2012), based around three core processes (opening, orientation and consolidation). Serendipity is included in the opening stage, specifically in terms of "undefined...open browsing" (Foster and Urquhart, 2012, p. 791).
- McCay-Peet and Toms (2015) consolidated the existing models of Rubin, Burkell and Quan-Haase, 2011; Makri and Blandford, 2012; Cunha, 2005; McCay-Peet and Toms, 2010; and Sun, Sharples and Makri, 2011 "into a single model of the process of serendipity, consisting of: Trigger, Connection, Follow-up and Valuable Outcome and an Unexpected Thread that runs through [the other] elements" (p. 1) (Figure 2, p. 9).

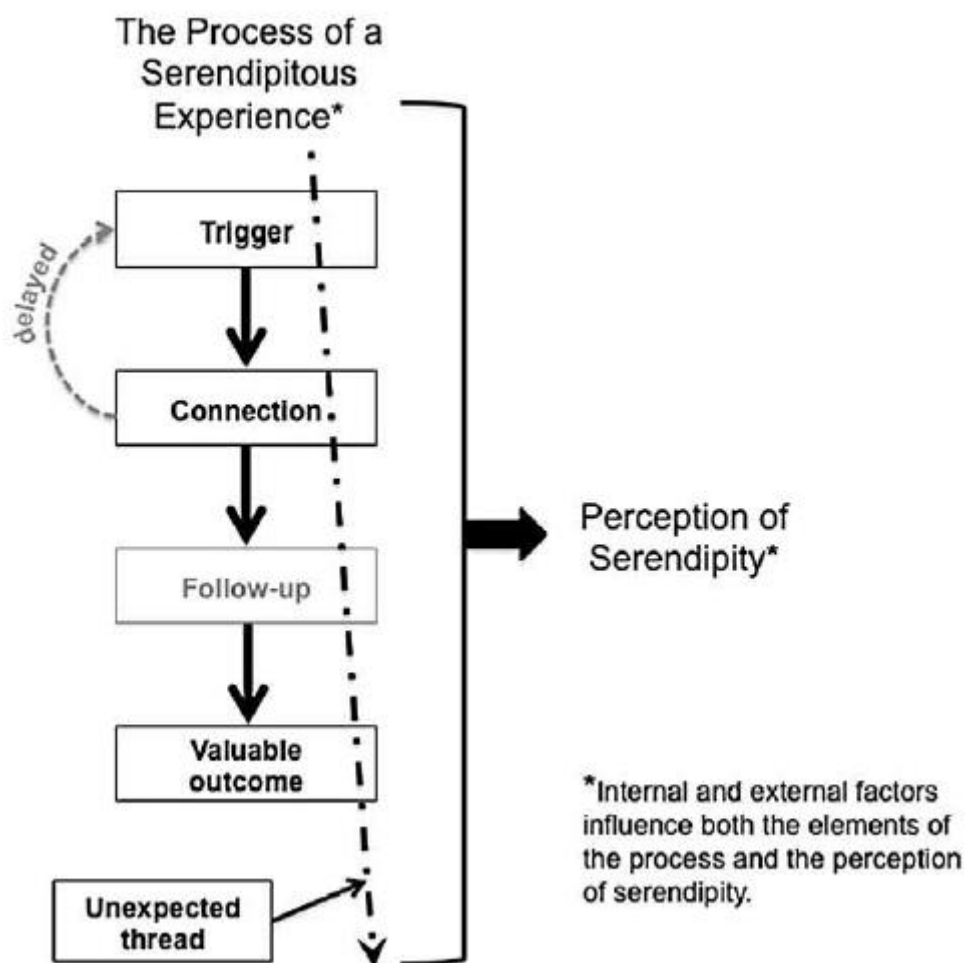


Figure 2 The process of a serendipitous experience (McCay-Peet and Toms, 2015, p. 6)

There is a “tendency for models to be published but never developed further, yet...any model is merely a starting point for wider testing and refinement” (Foster and Urquhart, 2012, p. 785). Such is the complexity of the term that there have been so many attempts to categorise it. Scholars are constantly reinventing the wheel because “no single general model of information explains serendipity” (McCay-Peet and Toms, 2015, p. 2). In fact, there are so many models that introducing “new terminology” is unhelpful (McBirnie, 2008, p. 613).

Watson (2008) considers that “differing levels and degrees of serendipity do seem to exist” (p. 34). One of his interviewees described:

The serendipitous moment when you go into a public library and pull this book off the shelf, and you see the next book on the shelf and pull that one off too, that's a fairly small serendipity, right? Real serendipity is when you pull that one off and walk down the aisle, and end up in a totally different set, and you notice the blue book that attracts your attention and you pull that (p. 34).

Bogers and Björneborn (2013) differentiate between: background serendipity, where you unexpectedly find something meaningful related to an interest that has been in the back of your mind which changes your focus and direction; and foreground serendipity, where you find something meaningful related to something you were thinking about at the time which confirms your focus and direction. It is questionable whether this second instance is serendipity. Morley and de Rond (2010) differentiate between: pseudoserendipity, where people find “what it was they were looking for by way of chance...the objective remained unchanged, but the route towards achieving this objective proved unusual and surprising”; and true serendipity, where they “discovered something different from what they were looking for” (p. 21) (cf. Roberts, 1989 and Van Andel, 1994). As Rumsfeld (2002) put it:

There are known knowns. These are things we know that we know. There are known unknowns. That is to say, there are things that we know we don't know. But there are also unknown unknowns. There are things we don't know we don't know.

It is the things we don't know we don't know that are of most interest to this project.

#### **4.1.1 Serendipity in information seeking**

Foster and Ford's naturalistic study of serendipity (2003) found that interviewees associated serendipity with “randomness”, “chance”, “accident”, or that they “just

happened to” do something that sparked off the acquisition of unanticipated information and “open[ed] your eyes to a whole new set of views” (p. 329; p. 331). Foster and Ford compared participants’ academic status, research topics and faculties and triangulated this with open-ended interviews. Their interviewees’ responses show that serendipity is considered a chance accidental discovery which diverts or changes the outcome of research, such as a chance suggestion of something to read that sparks off a new line of research, but one “could have gone to the end of [his/her] research without knowing it was there” (p. 333). In Sun, Sharples and Makri’s (2011) diary study, serendipity was found to both lead to unexpected connections or directions in research and solve existing problems. Participants recorded their serendipitous experiences for one week and then discussed them during post-study interviews, which reduced the time between something happening and it being recorded and the number of “memory lapses” in participants’ responses, as with other studies (c.f. McCay-Peet and Toms, 2010; Foster and Ellis, 2014). In Makri and Blandford’s (2011) workshop, groups of researchers and academics were “asked to write their examples of serendipity on large post-it notes and, with the aid of discussion, to classify them as *yes* (i.e. definitely serendipitous), *maybe* (possibly serendipitous) or *no* (on reflection, not serendipitous)” (workshop format, para. 2). Respondents considered chance scientific discoveries and coming across information, both in a library and on the web, as serendipitous.

## **4.2 WHY DO SOME PEOPLE EXPERIENCE SERENDIPITY MORE OFTEN THAN OTHERS? WHERE DOES THE ‘KNACK’ FOR ACCIDENTAL DISCOVERY COME FROM?**

### **4.2.1 The work of Jannica Heinström**

It seems impossible to measure every individual approach to information gathering. Heinström (2003 and 2010) advocates the use of the five-factor model of personality developed by Costa and McCrae (1992), which is based on five commonly agreed “dimensions that can be used to describe in cognitive, affective and social behaviour” (2003, section 4, para. 4) (Table 1, p. 12; Table 2, p. 13).

Table 1- Adjectives which correlate with the five-factor dimensions (Heinström, 2010, based on Costa and McCrae, 1992)

Five-factor trait	High levels of the trait	Low levels of the trait
<b>Neuroticism</b>	Anxious, fearful, worrying, tense, nervous, irritable, impatient, excitable, moody, pessimistic, shy, timid, defensive, inhibited, sarcastic, self-centred, hasty, excitable	Confident, optimistic, gentle, contented, clear-thinking, alert, efficient
<b>Extroversion</b>	Friendly, warm, sociable, cheerful, affectionate, outgoing, pleasure-seeking, talkative, spontaneous, aggressive, assertive, self-confident, forceful, enthusiastic, energetic, hurried, quick, determined, active, daring, adventurous, humorous, optimistic, jolly	Aloof, withdrawn, shy
<b>Openness (openness to experience)</b>	Dreamy, imaginative, humorous, mischievous, idealistic, artistic, complicated, enthusiastic, original, inventive, versatile, excitable, spontaneous, adventurous, optimistic, insightful, wide interests, curious, unconventional	Mild, conservative, cautious
<b>Agreeableness</b>	Forgiving, trusting, warm, soft-hearted, gentle, generous, kind, tolerant, friendly, sympathetic, intelligent	Suspicious, wary, pessimistic, hard-hearted, complicated, demanding, shrewd, autocratic, selfish, stubborn, headstrong, impatient, intolerant, outspoken, show-off, assertive, argumentative, self-confident, aggressive, idealistic, unstable
<b>Conscientiousness</b>	Efficient, thorough, resourceful, confident, organised, precise, methodical, ambitious, industrious, enterprising, determined, persistent	Confused, absent-minded, careless, distractible, lazy, fault-finding, hasty, impulsive, impatient, immature, moody, defensive



Table 2 - Textual summary of your report (Retrieved from <https://www.123test.com/personality-test/index.php>)

The Big Five Factors	Describing a low range scoring person...	Describing a high range scoring person...
<b>Emotional stability</b>	Experiences negative emotional reactions and feelings of anxiety • prone to worry	Not easily upset in stressful situations • relaxed
<b>Extroversion</b>	Reserved • formal • serious • quiet	Outgoing • friendly • assertive • likes working with others
<b>Openness to experience</b>	Traditionalist • down-to-earth • practical • conservative	Imaginative • open-minded • experimental
<b>Agreeableness</b>	Hard-headed • sceptical • competitive • proud	Compassionate • eager to please • good natured
<b>Conscientiousness (Work Ethic)</b>	Spontaneous • disorganised • prefers flexible plans	Conscientious • disciplined • efficient • well organised

In 2006, Heinström investigated the relationship between “incidental information acquisition to psychological factors: personality, study approach, and feelings” (p. 583). Over three questionnaires, she asked participants to rate on a five-point scale whether they had come across information when they were not looking for it. Heinström was looking to relate incidental information acquisition (IIA) to certain personality traits, approaches to studying and feelings. She found that ‘broad scanning’ (research across a range of sources) was more likely to be serendipitous than ‘deep diving’ (narrowly focussed research) or ‘fast surfing’, “where little effort is invested in information seeking” (p. 587).

#### 4.2.2 Openness to Experience

“At face value, openness to experience...appear[s] central to serendipity” (McCay-Peet, Toms and Kelloway, 2015). In Heinström’s study (2006), openness to experience was not found to be significantly related to IIA. This disproved part of her hypothesis, but supports her earlier findings where “there was a non-significant connection between openness to experience and accidental information discovery” (Heinström, 2003, results, para. 7). McCay-Peet, Toms and Kelloway (2015) also found the absence of a link between openness and serendipity. Heinström (2006) wonders without evidence whether openness is not enough unless supported by

activity, that openness lies behind the recognition of useful information and that reaching this point might require a more “energetic” approach (p. 591). McCay-Peet, Toms and Kelloway (2015) consider that openness may be a factor in serendipity, just not as a personality trait: “professionals and academics...have incentives to be open to experience relative to their work and research, motivations to keep an eye out for information and ideas that might be useful” (p. 28). Heinström (2010) argues that open people are naturally curious and perceive information-seeking as a “thrilling adventure” (p. 15, p. 29). They feel excited when searching: they “get a kick out of finding information” and compare it to a “treasure hunt, where you find something you didn’t know existed” (Heinström, 2010, p. 23).

#### **4.2.3 The importance of a good mood and having time to spare**

“An information seeker is not isolated from the multiple factors surrounding their information seeking” (Foster and Urquhart, 2012, p. 799). Heinström (2010) argues that anxious people “form tunnel vision ...which focuses attention so exclusively that unexpected stimuli” will be missed (p. 83). Foster and Urquhart (2012) found that feelings and emotion had an impact on “the willingness to undertake certain tasks” (p. 798). It is easier for us to learn new things when we are relaxed and happy (Heinström, 2010, p. 113). Makri and Blandford (2012a) found that people were “more willing to exploit connections when they were in a good mood and feeling relaxed and unwilling when they were in a bad mood, stressed, tired [or] time-pressured” (p. 694). Krotoski (2012) argues that:

You have to be open to new things and willing to pursue tangents so being super busy or focussed isn’t ideal. You need to be mentally able to make connections and be creative with them, which isn’t easy when you’re not feeling well and your brain is busy keeping you alive (10 mins).

McBirnie (2008) similarly argues that it is possible to close your mind to serendipity when focussed. When serendipity occurs, the individual chooses whether to act on it or not. If not, the serendipity that had been “filtered out” because “the individual considers they are too busy to be distracted” (p. 608).

#### **4.2.4 Conscientiousness**

Conscientious information seekers are, like the time-pressured, unlikely to find information by chance because they are so focused (Heinström, 2010, p. 43). These are people who, at the high end of the scale, “[explore] every possible piece of

information” (Foster and Urquhart, 2012, p. 792). We need to be open to the possibility that something random and unexpected could happen and act upon it; to be focussed but prepared to seize on ideas and circumstances as they arise (Mansfield, 2006; Makri et al, 2014). Makri et al. (2014) received comments that “if you have rigid boundaries you will cut off certain possibilities...having a healthy disrespect for boundaries is a pretty important attitude for encouraging serendipity” (visual artist, p. 2189). This ability to notice something unusual and seize upon it is a considerable skill. Dantonio, Makri and Blandford (2012) found that students came across social media content serendipitously “often when undertaking unfocused browsing during a break from academic work” (p. 1). Almost half of occurrences in their study were when participants were relaxed. Very few occurrences happened when participants were conducting focussed searches. These conscientious students considered serendipity as something that “kills time” and “take[s] people away from the path they were supposed to feel and contributes to losing focus” (p. 4). Focused searching does not aim for serendipity; it aims to find specific information to solve a specific information need. One would therefore expect people who prefer this way of information gathering to be less frequently serendipitous.

#### **4.2.5 Extroversion**

Heinström (2003) found that “extroverted students ...often found useful information by mere chance or through informal sources, like teachers and friends” (results, para. 7). In her 2006 study, the strongest connection to serendipity was extroversion, supporting Heinström’s hypothesis that extroverted students would be more likely to experience IIA. She suggests that extroverted people find information by chance because they search for it so vigorously and are constantly looking for new stimulation (Heinström (2010)). McCay-Peet, Toms and Kelloway (2015) suggest that the “interactions between individuals and other people are important throughout the process of serendipity” (p. 13). The link between extroversion and serendipity was also found by McCay-Peet and Toms (2015) and McCay-Peet, Toms and Kelloway (2015), though they see it as “relatively weak” (p. 28). McBirnie and Urquhart (2011) also “caution that social interaction is not a necessary precursor of serendipity” (p. 28). Extroversion does not determine serendipity. Although extroverts are likely to find information by chance because they are happy to approach people to fulfil their information needs, serendipity actually depends on

how you talk to people and how you interpret the information you find. Extroverts are “impatient information-seekers who want to find out what they need as rapidly as possible” (Heinström, 2010, p. 62), which in practice could make them no more serendipity-prone than the time-pressured.

### **4.3 WHY DO PEOPLE THINK IT HAPPENS?**

Makri and Blandford (2012a) sought to understand how researchers found information serendipitously through semi-structured critical incident interviews. Responses suggested that serendipity was seen as “a mix of unexpectedness and insight [that] led to a valuable, unanticipated outcome” but no “interviewees mentioned the role of insight or sagacity” (p. 684 and p. 693). McBirnie (2008) similarly observed that “recognition of the role of sagacity was less common” (p. 607), which suggests that individuals are not aware of sagacity. Krotoski (2012) believes three elements need to be present for serendipity to occur: the accident or chance encounter; insight to make the connection between the two things that bumped together (sagacity); and the ability to attribute value to the connection, to make sense of something.

It is claimed that serendipitous insights tend to occur during idle times, not necessarily immediately but after the thought has been incubated in the mind for some time (Csikszentmihalyi and Saywer, 1996; McCay-Peet and Toms 2010; McCay-Peet and Toms, 2015). For Makri and Blandford (2012a), the value of the experience may be apparent when it happens or there may be a considerable delay between experiencing serendipity and realising that it was serendipitous: “serendipity doesn’t exist until you have hindsight, until you’ve gone through it and thought about it” (p. 696). McBirnie and Urquhart (2011) argue that “serendipity requires retrospective sense-making: we can only identify serendipity after it has happened, not while it is happening” (Introduction, para. 5). Foster and Urquhart (2012) describe “a pause in information seeking” where researchers consolidate what they have found and draw out the ideas (p. 796). Cox and Ince (2015) suggest that scientists should be allowed time to be curious. They cite the discovery of graphene, which won a Nobel Prize, where Gelm and Novoselov “discovered something wonderful in that playtime” (17 mins). They argue that the increasing pressure in academic institutions to justify research means there is less time to go off and experiment (c.f.

Jackson in McCay-Peet, Toms and Kelloway, 2015). McCay-Peet and Toms (2015) found that “the trigger [for serendipity] often appeared to occur during temporary states of unfocused attention in which attention was not directed and behaviour was more exploratory, more open” (p. 10). Makri and Blandford (2011) argue that one needs to be in a suitable place to have a serendipitous encounter and to be reflective enough to realise at a later stage that what occurred was serendipity. They suggest libraries or bookshops are suitable locations or that one should be in a situation where they are able to think, such as washing up. However, Van Andel (1994) considers that you have to be “on the outlook of anything strange” (p. 645). The suggestion is that if you are not looking, have your head to the ground and are firmly concentrating on what you are doing, serendipity will not happen.

#### **4.4 IS SERENDIPITY SOMETHING THAT CAN BE LEARNT? IS IT AN ACCIDENT OR A CAPABILITY? DO PEOPLE LOOK FOR SERENDIPITY?**

“The notion of ‘seeking’ serendipity is, at first glance, an oxymoron; serendipity includes an element of unexpectedness and therefore cannot be sought out at will” (Makri et al, 2014, p. 2180). Cox and Ince (2015) consider that “when you’ve actually got really smart, observant, curious people, then they will pick up on the ‘oh that’s weird, oh, it’s not quite what I expect, why isn’t it?’”. They consider that you need to have “the right sort of mind to pick up” the “incredibly small differences” that lead to these clues (22m). Is serendipity accidental or is it dependent on your “capacity to make unusual associations between ideas” (Simonton in McCay-Peet and Toms, 2010, p. 2)? It may be accidental that something comes to your attention but the interpretation or discovery that follows is not so accidental, because it requires thought (Ross (1999)). We choose to search a catalogue, to do a certain experiment, to go out at a certain time of day and although some library users believe:

Their success in finding just the right book, article, or bit of information has been due to serendipity, librarians and sophisticated library users, of course, know better. They *expect* serendipity when they browse the shelves, realizing that there is a system and people behind the scenes, preparing the collection for such happy discoveries (Cooksey, 2004, p. 24).

It may be unexpected that something happens, but it depends on an individual to interpret and act on what they see. The argument is that serendipity involves so much skill that it cannot be purely accidental.

#### **4.5 HOW DO PEOPLE COME ACROSS INFORMATION SERENDIPITOUSLY?**

Nutefall and Ryder's (2010) exploratory study of research methods suggests that people stumble upon information serendipitously when they are not looking for it and do not start with a "narrow question" (p. 231). Students consider such serendipity a positive experience: "using things you just stumble upon...one clue would lead to another clue would lead to another clue" (p. 231). McCay-Peet and Toms (2015) go further to declare that "there must be a positive aspect to an experience for it to be perceived as serendipitous" (p. 7). McBirnie's (2008) semi-structured interviews of jazz improvisers and academics about their experiences of improvising, information seeking and serendipity found that "serendipitous events were not just good; they were seen as extremely exciting and positive... two participants recounted events where the information essentially 'found them'" (p. 607). Erdelez's survey and in-depth interviewing (1997) highlighted the change from negativity (frustration, boredom, anxiousness) before encountering information to the happiness and satisfaction that followed serendipity.

Johnson and Walsh (2013) conducted semi-structured interviews with twelve drama lecturers and researchers. They divided their participants into two groups: those who "followed the path" and those who "explored the landscape" (p. 73). While those in the first group looked for specific quotes and used suggested reading material, those in the second group enjoyed the information seeking process: they were "open to what might be out there [and were] continually seeking out new paths, alternative views and taking risks" (p. 78). They absorbed information and made connections later because they considered "the journey...more important than the destination" (p. 79). They liked to browse, flick through periodicals and glance at titles, abstracts and pictures and see what grabbed them. Johnson and Walsh's evidence suggests that open-minded people who are happy to take risks and meander until they come across something useful are more likely to experience serendipity.

#### **4.6 DOES FINDING INFORMATION BY BROWSING STILL HAPPEN OR ARE PEOPLE MORE LIKELY, IN THIS DIGITAL AGE, TO EXPERIENCE SERENDIPITY THROUGH DIGITAL MEDIA THAN THROUGH TRADITIONAL METHODS OF INFORMATION SEEKING?**

Is there a method of searching for information that is more likely to result in serendipity than others? And is this connected to the individual's personality? As Line (1998) argues:

All people are individuals and will seek and use information in different ways. Information gathering is an integral part of our personalities, and we all do it differently....some of the group will scan and absorb vast quantities of material, others will read much less. Some will be content with abstracts of many articles, others will not. Some will prefer oral channels, some will prefer to see information in print, where they can pore over it; some always prefer to ask other people, some prefer to avoid people wherever they can. Some like browsing, some find it wasteful in time and effort. Some enjoy computer searching, others have technophobia (p. 223).

Browsing is a form of information seeking without a clearly defined purpose, so it seems logical to think that it will result in serendipity. Toms' (1998) study, where participants were asked to read the newspaper "as they normally would" and then asked why they selected particular articles, found that participants were, like Foster and Ford (2003), "just looking for something that leaped out" (Toms, 1998, p. 200). Toms (2000) found that browsers look at more material than focused searchers. Ross (1999) conducted intensive, open-ended interviews with a purposive sample of 194 adults who "read a lot and read by choice" (p. 786). Participants used their mood, experience and knowledge of authors, reviews and recommendations from family and friends when browsing a bookshop or library. They either checked the just-returned section of the public library first because that is where they expected to find popular novels or "just walk[ed] along an aisle in a library, [ran his/her] finger along the spines of the books and just [went] 'stop now' and pull[ed] it out" (p. 790). People do find information by browsing; they do not necessarily have to plan their search beforehand.

Heinström (2010), argues that we often find information while surfing the internet" and that this approach "inspires divergent thinking" (p. 116). On one level the internet is well set up for serendipity: websites such as stumbleupon.com recommend websites to users with similar interests, while Google Scholar links to related articles in its search results (Makri et al., 2014). McCay-Peet, Toms and Kelloway (2015)

found that serendipity happened most often through social media (incidentally this was also the source of information preferred by open students, so there may yet be a link). Before the internet, the search for information took far longer. Ferguson (1999) notes that: “in a world where everything is meant to be instantly accessible to everyone all at once, there is little room for the unexpected detour and no room at all for the delicious anticipation that comes from ambition temporarily defeated” (p. 194). However, Krotoski (2012) asks: “did we find newspapers that enlightening? Did you stumble across books in bookshops before the internet? People talk of us losing things with the internet, but did we really? Or is it just imagined nostalgia? We have always filtered information” (24 mins).

Is serendipity threatened by the increasing use of technology in research? Being offered search suggestions by Google limits the chance of “running into something you were not expecting” (Krotoski, 2012, 23 mins). With the internet, it is easy to find information you need, but harder to “find information [you] need but do not realize [you] need” (Makri et al, 2014, p. 2182). Martin and Quan-House (2013) found that although e-books were convenient and saved the researcher a physical trip to the library, the ten historians they interviewed were “concerned about the loss of serendipity in digital environments” (p. 1016) because keyword searching focuses so closely on what you ask it to find. McCay-Peet and Toms (2009) tested the effect of suggested pages on 96 undergraduate and postgraduate students when they were “doing other work” (p. 192). They consider that there is a danger that “serendipitous discovery [has] the possibility for diverting attention away from a task, leading to unproductiveness” (p. 192). Although suggested pages were deemed to be useful when they were related to the search aim, they were felt to be a “distraction” and were confused with “sponsored links” and no substitute for thinking about things because a computer cannot think for you (p. 198). Students will “shut off potential avenues of research” (Nutefall and Ryder (2010), p. 232) by spending little time evaluating information (Williams, Rowlands and Fieldhouse, 2008; CIBER, 2008) and using the sources that are the most convenient, accessible or involved the least effort (principally Google) (Shenton and Dixon, 2004; Fidel et al, 1999). Foster and Urquhart (2012) found that undergraduates stopped researching when they had found “enough information to go on with the essay” (p. 795). They were searching for an “immediate outcome” and used the information on the first relevant webpage they



“clicked on” (p. 799). Such surface learning is hardly constructive ground for serendipity.

#### **4.7 CAN A LIBRARY FACILITATE SERENDIPITY? IS THERE ANYTHING A LIBRARY OR INFORMATION SERVICE COULD DO TO HELP USERS FIND INFORMATION IN THIS WAY?**

There are many famous examples of serendipitous discoveries: penicillin, gravity, electromagnetism, the smallpox vaccine, Velcro, liquorice allsorts, post-it notes, Coca Cola. Columbus famously discovered America accidentally while sailing for the Far East (Eco, 2000). However, serendipity also occurs in more ordinary, everyday circumstances, often in libraries:

- Finding information for one project or assignment when searching for information for other work (Makri and Blandford, 2012a);
- Finding information through displays, promotions or return trolleys;
- Overhearing conversations;
- Finding an article left behind at the photocopier (Erdelez, 1997);
- Being guided by marks left by previous readers such as worn covers and pages, notes scribbled in books and books left-behind on tables (Björneborn, 2011a);
- Thinking randomly of someone and then that same person calls (Leong, 2007);
- Discovering that your neighbour has a bike to sell when you need a new one (Makri and Blandford, 2012a);
- Suddenly discovering that a certain database or useful journal exists (Cooksey, 2004);
- Being tempted by targeted advertising, which can take you away from what you were originally viewing (McCay-Peet and Toms, 2009).

How can we take advantage of this to increase the likelihood of our users experiencing serendipity in our libraries? The library could be arranged with the “curious organization” and deliberate “disorder” (Gopnik, 2015, para. 3 and para. 30) of the Warburg Institute Library, London, which is “not based on what libraries alphabetically catalogue. Instead it’s catalogued according to themes. The methodology of serendipity is what it’s all about and the methodology of serendipity

is responsible for most great ideas” (Palmieri in Gopnik, 2015, para. 8). The Bohemian bookshelf (Thudt, Hinrichs and Carpendale, 2012) “provides a visual overview of books based on their cover colour [and] keyword chains” (Makri et al, 2014, p. 2183). The blended shelf (Kleiner, 2015) “displays new, recently returned, often borrowed and randomly selected books” (Makri et al., 2014, p. 2183). Watson (2008) suggests incorporating a Google-style “I’m feeling lucky” button to the side of search results. Burkell, Quan-House and Rubin (2012) suggest introducing random elements into search queries. Makri et al (2014) recommend ways of suggesting sources “that are somewhat related to users’ interests” (p. 2187). These are all strategies which are much more specific and easier to understand and work with than the elusive term serendipity; it “reduce[s] the size of [the] leap” (Makri et al., 2014, p. 2193).

Libraries could arrange their layout in a way which would “increase [the] chances of accidentally ‘bumping into’ desirable discoveries” (Knudsen and Lemmergaard, 2014, p. 407). Google’s new building was designed to maximise “casual collisions” with no employee being more than two and a half minutes away from another. Dooley considers that “if you just think of serendipity as an interaction with an unintended outcome, you can orchestrate pleasant surprises” and has introduced sofas by doorways and comfortable seating in offices at Stanford University “to encourage lingering conversations” (in Lindsay, 2013, para. 9). The role of collaboration in serendipity is advocated by Cox and Ince (2015), who “have a theory that in science you get greater serendipity when you have a group of people...as a group whether there’s more chance of serendipity when you’re bouncing off people” (15 mins) and by Yahoo, who banned its employees from working from home in February 2013 because “some of the best decisions and insights come from hallway and cafeteria discussions, meeting new people, and impromptu team meetings” (as cited in Lindsay, 2013, para. 1).

#### **4.8 IS THERE STILL A STIGMA AROUND FINDING INFORMATION BY ACCIDENT? ARE PEOPLE EMBARRASSED BY SERENDIPITY (LIESTMAN, 1992)? WHY?**

Campanario (1996) offers four reasons why serendipity is undervalued in science:

- It would cast doubt on the academic preparation involved in scientific work;
- We consider scientific work as something entirely under our control;

- Science emphasises the need to control all variables in experiments;
- The concept of fair play suggests more merit should be given to discoveries made through hard work than found unexpectedly.

Serendipity seems to threaten reputation. Columbus, far from being proud of his accidental discovery of America, “denied until his death that he had found an ‘unsought’ finding. We still speak of ‘Indians’” (Van Andel, 1994, p. 646). Nutefall and Ryder (2010) ask “how many librarians really want it known that they just happened to stumble across a citation rather than locating it as the result of a sophisticated search strategy?” (p. 229). Alcock (2010) considers that the issue is less that serendipity is rare, but that researchers “hide it[:] reputations have to be built (and spared); publications have had to be authoritative... ‘whoopsies’ (however sagaciously handled) have had to be muted or erased” (p. 22). Consequently serendipity is often overlooked in favour of a ‘proper’ planned search strategy and is seen as a potential cause of embarrassment or ridicule (Erdelez, 1999, Foster and Ford, 2003; Dantonio, Makri and Blandford, 2012; Foster and Ellis, 2014). Despite all the positive responses to their study, Nutefall and Ryder (2010) found that serendipity was seen as a “novice method” of information gathering, in which information was acquired eclectically through “ever evolving searches” without a search strategy and as a sign that the student needed training (p. 232). However, Nutefall and Ryder (2010) are sure that “the more serendipity is talked about, the more accepted it will become as part of the research process” (p. 233). Dantonio, Makri and Blandford (2012) consider that serendipity deserves a “positive stigma – as a potential driver for novel research and valuable collaborations” (p. 11). Does this stigma exist and what impact does it have on information behaviour?

#### **4.9 SERENDIPITY IS HARD TO MEASURE OR ANALYSE**

Being highly personal, serendipity is very hard to measure or analyse: “the same event might be serendipitous for me and a disaster for someone else” (one of Makri and Blandford’s (2012b) interviewees, p. 715). Serendipity is subjective, unexpected, unpredictable, unintentional and rare. How can you reliably capture something accidental (ask Foster and Ellis (2014))? You are chasing chance (Krotoski, 2012). You are trying to measure something that by its nature cannot be measured. As Krotoski (2012) argues: “you can’t set out for the island of serendipity; you just have

to set out in good faith” (6 mins). Serendipity is not something that can occur on demand: “I almost feel you will frighten it away if you want it too much. If you’re greedy you’ll just have an accumulation of information, not connections” (Phil Smith in Krotoski, 2013, 25 mins). Serendipity cannot be planned for or programmed: “any attempt to design [or engineer] serendipity is to extinguish the phenomenon itself” (Leong, 2007, p. 4). In fact, “as soon as you attempt to do so you effectively make it disappear” (Krotoski, 2012, 8 mins).

Foster and Urquhart (2012) found serendipity a “challenging...concept for coding” because “it was by no means certain that an independent dataset would pick up the same aspects or that new coders would view the data in a similar way”, which led to “misunderstandings” (p. 791). Some academics consider that “part of the challenge of studying serendipity is how to artificially induce it” (McCay-Peet and Toms, 2009, p. 195). This will inevitably limit the research, because it will all be artificial. Erdelez (2004) “attempted to trigger serendipity” (McCay-Peet and Toms, 2010, p. 1), by creating a laboratory situation where an online “trigger” was embedded to divert a group of graduate students away from what they were doing. However, it backfired somewhat and the users were left wondering “what this study is all about”, that it was “odd” and that “the computer had not done what I instructed it to” (p. 1021). One was not fooled at all: “I wonder if they really got that result from a search engine or whether they planted it there because of our assignment?” (p. 1021). Dantonio, Makri and Blandford (2012) “found that serendipity is difficult to replicate in a controlled setting” (p. 2), while Makri et al. (2014) suggest that “if we attempt to ‘engineer’ serendipity through technology” and try “to offer serendipity on a plate... users may no longer perceive the experience to be serendipitous” (p. 2181).

McCay-Peet and Toms (2010) examined the “previously collected data” of interviews with ten historians (p. 2) to explore the precipitating conditions they believed must be present to experience serendipity. However:

Because participants were not asked specifically about their serendipitous experiences, information regarding their encounters is incomplete. Participants revealed the parts they remembered, the parts that were most interesting to them, or the parts they thought would be most interesting to the interviewer (p. 2).

This often left McCay-Peet and Toms without details of the trigger that led to serendipity or the task the participant was working on at the time. Makri et al. (2014) and McCay-Peet and Toms (2015) described similar issues with their “self-reported” findings (Makri et al., 2014, p. 2184). André et al. (2009) asked eight colleagues to review their search history and report any “results that they deemed to be not directly task-related” (p. 307), but three of these six mentioned that their searching at work was extremely focused and they do not allow themselves to “wander off” as they may do at home (p. 307). The study seems flawed because it would be expected that people will focus at work.



*Figure 3 The serendip-o-matic (Croxall et al. (2013)).*

André et al. (2009) argue it would be possible to “design a system that would facilitate serendipitous discovery” but it would still be up to the individual to notice the significance of what they find (p. 307). McCay-Peet, Toms and Kelloway (2015) have similarly not given up hope that “we can design digital environments to better support serendipity” (p. 24). Krotoski (2012) created a “serendipity engine” to see if we can pin serendipity down enough to reduce it to “something predictable” (10 mins). The engine determines, by asking a few questions, how likely you are to see an accident as happy or not. It offers a recipe: words, a place to consider them in, what you should be doing there and who you should be with. It is a good theory, but Krotoski (2013) concedes herself that “a machine can’t give you a direction and change the course of your life. You have to do that. All the machine can do is give you inspiration” (27 mins). The serendip-o-matic (Figure 3, p. 25) connects a block of text entered by an individual to materials located in digital connections around the world, giving suggestive results to sources and images they might not have considered. It is a fantastic idea, but the results are entirely random and not very relevant or useful. It

is missing the human sagacity element of serendipity: “the trouble is, we can make connections to bring about a sort of serendipity, but the bit that is missing is the human brain, the thought of “Oh, wow, here’s something I can use” (Krotoski, 2012, 19 mins). This investigation will use questionnaires and interviews to gain real life examples to understand how this phenomenon naturally occurs rather than trying to create an artificial situation which can never produce true serendipity, even if they are “retrospective” and of “limited insight” (Rubin, 2011).

## 5 Methodology

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### 5.1 SCOPE OF THE STUDY

This study of serendipity has the following objectives:

1. To examine via literature analysis what the concept means to researchers and those who experience serendipity;
2. To identify examples of literature where the characteristics and personality traits associated with serendipity are identified;
3. To explore how individuals across different subjects (arts and sciences) and levels of study experience serendipity;
4. To establish whether it is felt that there is a stigma attached to finding information serendipitously;
5. To conduct simple personality tests to find out if people think they have the sort of characteristics the literature suggests increases the likelihood of experiencing serendipity (such as curiosity, extroversion, good mood, high intellect, information literate) and relate these tests to the individual's reported experiences of serendipity and the frequency with which they experience serendipity;
6. And to relate the findings of this study to the wider body of work on serendipity.

### 5.2 SEARCH STRATEGY

The literature read was mostly found by browsing the bibliography of McBirnie (2012) and by browsing bibliographies of the articles in her bibliography. Searching Aber Primo for "serendipity" revealed Merton and Barber (2004) and McBirnie (2012). Searching Science Direct for "serendipity" found Cunha (2010) and Nutefall and Ryder (2010). Searching Emerald for "serendipity" found Makri and Blandford (2012) and Foster and Ford (2003). Web of Science was used to find the most cited authors and recently published articles connected with the topic. Bawden (2011) was found serendipitously while using the book to read another chapter for the Principles of Information Retrieval module of the degree course and formed the inspiration for this

choice of topic. Johnson and Walsh (2013) was found accidentally while searching for “library innovation” to find new ideas for the researcher’s place of work. Literature which started going into the realms of general psychology and information retrieval was rejected because there appeared to be no need to read articles that were largely unrelated to serendipity when there is so much literature that makes the connection between information retrieval, psychology and serendipity.

### **5.3 AVAILABLE POSSIBLE METHODS**

Serendipity can be notoriously difficult to measure and analyse (Makri and Blandford, 2012b; Foster and Ellis, 2014; Krotoski, 2012; McCay-Peet and Toms, 2009; Leong, 2007; Dantonio, Makri and Blandford, 2012). Methods needed to be selected with care. There are many ways this research could have been conducted. A task, experiment or a machine could have been designed, like André et al (2009), McCay-Peet and Toms (2009), Toms (2000), Erdelez (2004) or Krotoski (2012). Previously collected data could have been used like McCay-Peet and Toms (2010). The study could have used completely open-ended interviews like Foster and Ford (2003) or wholly unstructured interviews, which would have been really interesting but proved very little. Rigidly structured interviews or intensive interviews like Ross (1999) could have been used, but they would have proved very little because a structured interview could not cater for an elusive subject like serendipity. Observations were another option, but this would probably have meant waiting for a long time for results! If the study not restricted by time, money or location, a diary study could have been undertaken like Sun, Sharples and Makri’s (2011) or a workshop or focus group like Makri and Blandford (2011).

### **5.4 METHODS ADOPTED AND WHY**

The study aimed to take a fairly naturalistic approach, as the literature shows that attempts to artificially ‘trigger’ serendipity are not that effective. A naturalistic approach aims to “lead to a maximum understanding of the phenomenon being studied in its context” (Lincoln and Guba, 1985, p. 225). This meant “milestone events” could not be met to show that the project was “on track”: the project could not be “determined by a predetermined schedule” (Lincoln and Guba, 1985, p. 225). Designing a naturalistic methodology is difficult because “the design of a naturalistic inquiry *cannot* be given in advance; it must emerge, develop, unfold” (Lincoln and



Guba, 1985, p. 225). However, these elements are not limitations because a naturalistic approach is entirely suited to studying something as undefinable as serendipity. Having a naturalistic approach meant the focus, procedures and research design were likely to change as more was learnt about serendipity, and they did: the study was increasingly seeking to prove or disprove Heinström's ideas of what a serendipitous person was like.

The unpredictable and individual nature of serendipity makes questionnaires and semi-structured interviews the most suitable methods of data collection (see appendix 2, 3 and 5). Qualitative research methods enable the researcher to “keep more of an open mind about what...he or she needs to know about, so that concepts or theories can emerge out of the data” (Bryman, 2012, p. 12). Working closely with “the people being investigated” during interviews and the nature of the conversations meant it was possible to “genuinely understand the world through their eyes” (Bryman, 2012, p. 40). Questionnaires and semi-structured interviews are common methods of studying serendipity in the literature (questionnaires Heinström, 2002, 2006; semi-structured interviews McBirnie, 2008; Makri and Blandford 2012; Johnson and Walsh, 2013). Semi-structured interviews are particularly appropriate because the interviewer still “prepares a basic checklist to make sure that all relevant areas of the research are covered” (see appendix 5) while still being “free to explore, probe and ask a question not previously specified when something interests you” (Pickard, 2013, p. 200). At many times additional questions were asked to what was on the interview guide. For example, with no. 23, the interviewer was able to check what she meant by her answers which led to the disclosure of more information:

Interviewer: So the idea comes first and then you're looking for information, is that right?

No. 23: Well... yes, because I thought: well ok, you can start with information, what it means in Latin... oh gosh, now I don't remember. Yeah, possibly it came first the idea and then the information, but I cannot be 100% sure...

Interviewer: You can learn to be more confident, but not necessarily to be serendipitous. Is that what you're saying?

No. 23 Well, yeah, more confident, but more open, yes, I don't know whether it could be considered confidence. Yeah, but possibly they are connected, like being more aware, not learned because from my point of view learn is something you learn from a book or you go to a course. Maybe you can go to a course, but then yeah, possibly... It's not like it's something you can learn.

And then ask questions that were not planned to be asked, that were thought of at the moment:

Interviewer: Do you think there is more room for serendipity in everyday life than there is in academic study?

No. 23: I think so, from my experience definitely yes. It must be said that in my workplace I really get on very well with my colleagues, and we like, you know, especially with some of them we like getting creative ideas, so you know it's different well, while for university I was by myself, so again I didn't have a lot of serendipitous experiences as at work, for instance...

Interviewer: Do you think Google might be a better source of serendipity than a library catalogue? Which is more likely to result in serendipity: Google or a database?

No. 23: That is a very good question. I think it depends. I always say that you know must be in the right place at the right moment. I would say that both could be very useful if you are in the like, I can say the serendipity mood because it seems that, you know, you get in the mood but then if your mind is open to get ideas, to get the serendipitous mood, any database could be possibly – any library or a database could be potentially useful. Even maybe Facebook could be useful.

In one case, such an interesting conversation about the concept of serendipity was taking place with someone who clearly thoroughly understood it and for whom it was a large part of his/her life (no. 4), that it was decided not to worry too much about the rest of the list of questions! Semi-structured interviewing gave the research this flexibility.

Questionnaires provide “the opportunity to give considered, more accurate answers, as the respondent has time to think things through” (Ellis et al., 2010, unit 5, p. 3). Follow-up interviews enabled responses to questionnaires to be clarified and to discover individual opinions (Pickard, 2013). In this way the research was triangulated. Interviews helped gain detailed answers to questions which

Are too complex to be answered in a straightforward way...people will nearly always write as little as possible when asked a question; if they are asked to reply verbally they are far more likely to talk at greater length and depth about the topic (Pickard, 2013, p. 205).

It is possible that the interviewees guessed their answers if the serendipitous event occurred in the distant past: “it is very rare that individuals can instantly recall any great quantity of precise factual data without consulting records of some kind” (Pickard, 2013, p. 196). Responses to open questions require greater effort from

both the respondent, in thinking how to reply, and from the researcher, in analysing their response, and it is more difficult to accurately record what was said. The data is more likely to vary because respondents can reply as they like (Pickard, 2013).

As with Makri and Blandford, (2011 and 2012a), Makri et al. (2014) and Bogers and Björneborn, (2013), the interviewer did not (unless asked) provide participants with a definition of serendipity because the aim was to see how they understood the concept without influencing the “understanding of the term” (Makri and Blandford, 2012a, p. 688) and nullifying the data. Intentionally, many of the questions were open so that “respondents can answer in their own terms” (Bryman, 2012, p. 247). Like Makri and Blandford (2012a), the interview guide was used “only loosely” so that interviewees could “lead with the story of their examples” (p. 688). Makri and Blandford found this interview style “particularly suitable for exploring a slippery phenomenon such as serendipity, as it enabled interviewees to reflect on the nature of the phenomenon rather than simply recall and recant their serendipitous experiences” (p. 689).

The study adapted and added to the questions used in Sun, Sharples, and Makri, (2011) and Heinstrom (2002). The questionnaires were distributed by the researcher and via people known to the interviewer who are currently studying at UK universities. Follow-up interviews were conducted via Skype because the researcher was not based within an easy distance, nor worked in, a university. The questionnaire was circulated via UK Lib Chat (<http://uklibchat.wordpress.com/>) and around the researcher’s fellow students, which gathered the views of some people working in the library field.

## **5.5 POPULATION**

The study aimed to collect an equal sample of undergraduate and postgraduate responses and an equal divide between arts and sciences (both of which were very nearly achieved). It was initially hoped that the study might encompass different countries and cultures, but in the end the respondents were predominantly British.

## 5.6 SAMPLE

The study aimed to gather 50 responses to the online questionnaire and, from these responses, conduct between five and ten interviews. The sample is quite diverse in terms of experience profiles and the subjects and medium of study.

*Table 3 Overview of survey respondents*

<b>Survey overview</b>
Number of respondents: 48
Expected number of respondents: 50
Response rate: 96%
Launch date: 22 November 2014
Close date: 31 <sup>st</sup> December 2014

32 undergraduate (66.6%)	10 master's (20.8%)
3 doctorate (6.3%)	3 unknown (6.3%)

<b>Degree Level</b>	<b>No.</b>	<b>%</b>
Undergraduate	32	66.6
Master's	10	20.8
Doctorate	3	6.3
Unknown	3	6.3

<b>Age</b>	<b>No.</b>	<b>%</b>
18-24	28	58.3
25-34	12	25
35-44	5	10.4
45-54	3	6.2

<b>Arts</b>	<b>Social Sciences</b>	<b>Sciences</b>
1 animation	1 economics	7 animal behaviour and welfare**
4 English literature	7 information and library studies*	1 botany
1 geography	1 intercultural communications	2 engineering
1 history of art	1 international relations	1 health sciences
2 law*		2 marine ecology & conservation
1 anthropology/horticulture		1 medicine*
2 music*		1 nautical sciences
5 philosophy (one pure, one with politics, 1 with theology, 1 PPE)		3 zoology*
1 theology*		
1 maths and philosophy		
1 maths and linguistics		
20	10	18

\* indicates a person who thought the accidental discovery of information was not respected in their field of study.

11 people indicated in their survey response that they would be happy to be interviewed. In the end, 8 interviews were completed: 5 female, 3 male; 4 undergraduate; 4 master's (response rate 72.7%).

As the sample was gathered by passing the questionnaire to a few individuals who then passed it on to people they knew, the sample was gathered through snowball and purposive sampling. It was fortunate that the sample ended up being representative: as questionnaires were not distributed by the researcher, it was hard to ensure the sample would be representative. It is possible that more responses were gathered from people who were interested in the topic than those who were not and a few incomplete responses were received. It is unlikely that this sample was fully representative because it was not generated randomly.

## **5.7 ETHICAL ISSUES**

Responses have been kept confidential and treated anonymously: the names of participants were only recorded to enable follow-up interviews to take place.

Informed consent was gathered before participants completed the questionnaire and before they were interviewed (appendix 4). Participants were made aware of their right to withdraw from the study at any time and asked for permission to record the interview. This study did not involve under 18s. There were ethical issues around collecting such personal information about individuals' personalities, which is why it was so important to keep the study as anonymous as possible and not pressure any individual to take the study further than they were comfortable with. Occasionally personal information arose during interviews – on three occasions relationships were discussed – so care was taken to treat this information sensitively when it came to writing up the project.

## **5.8 DATA ANALYSIS**

Interviews were transcribed from audio recordings and the data was analysed and coded according to what explanations and arguments could be built from the data, particularly: repeated words or phrases, words people used to describe serendipity, the reasons people gave for things being the case or thinking as they did, and answers to questions which contributed to the study's research questions (appendix 5). Use was made of tools available through Bristol Online Surveys (<https://www.onlinesurveys.ac.uk>) which hosted the questionnaire, where it was possible to browse responses, browse answers to specific questions, tabulate answers to specific questions and compare the answers across the survey to two or more questions.

## **5.9 LIMITATIONS AND LESSONS LEARNED**

Those who had completed an undergraduate degree but had not gone on to complete postgraduate study did not consider themselves undergraduates and used the 'other' option. This shows that an additional option to this question needed to be included. The tools available through Bristol Online Surveys could not help analyse the answers made to free text questions, which made this data time-consuming and difficult to analyse. As it was left to the respondent to indicate what they were studying in free text, it made it very difficult to compare the results to subject studied.

The respondents should have been asked to indicate whether they studied arts, social science or science and then the data could have been extracted from the survey. It is, however, possible to compare *level* of study to frequency of serendipity.

*Table 4 Summary of results for Question 7. Are you an undergraduate, master's or doctorate student, cross-tabulated with the frequency with which respondents experience serendipity*

<b>Question 7. Are you an undergraduate, master's or doctorate student? (If none of these, please state your level of study or your occupation.)</b>					
<b>13. How often do you discover information by accident?</b>	Undergraduate	Master's	Doctorate	<i>Other</i>	Totals
<b>Almost always</b>	1 (3.2%)	0	0	0	1
<b>Very frequently</b>	9 (29%)	2 (20%)	2 (66.6%)	1	14
<b>Often</b>	10 (32%)	4 (40%)	0	1	15
<b>Occasionally</b>	12 (38.7%)	4 (40%)	1 (33.3%)	1	18
<b>Never</b>	0	0	0	0	0
<b>Totals</b>	31	10	3	3	48

It is hard to generalise from this data because the sample, especially at the doctorate level, is very small. Therefore the study is indicative in the same way as a pilot study would be and is not aiming for generalisability, rather an indication of what may be the case. The data does not show conclusively that serendipity increases with academic level. Undergraduates may be slightly less serendipitous and the frequency of serendipity may increase at doctorate level. It would be interesting to compare this result with a sample of respondents with equal numbers at undergraduate, master's and doctorate level.

In the pilot questionnaire, it was found that:

- Responses differed depending on the age of the respondent. Respondents were asked their age in the real questionnaire, which provided another point on which to measure the data.
- Some struggled to interpret the results page of the personality test. As it was so important that respondents inputted their results from the personality test into the questionnaire, the questions that followed the personality test were

changed to accommodate both those who would read the text and those whose eyes would go to the pictorial illustrations (graphs) of their results.

- One expressed concern that they could not think of an example at the time of completing the questionnaire and this made them feel “inadequate for the test”. Very short responses to the questions asking people to describe their serendipitous experiences were also received. Consequently, the question was changed to “can you think of a specific example of an instance where you had a creative idea or discovered information unexpectedly?” rather than “please describe a situation in your academic life when you had a creative idea or discovered useful information you weren't looking for”. Those who could think of a specific example and were happy to be interviewed were asked more about it at interview to collect more detailed responses.
- The question on serendipity's stigma was rephrased from “do you think discovering information by accident is embarrassing?” to “within your subject, do you think discovering information by accident is respected?” to gather a more interesting spread of results, as in the pilot all respondents said it was not embarrassing.

The additional question on whether a library can facilitate serendipity thought of during interviews, so it was only asked in two interviews. The question was circulated by email and responses to the question were received by two people who had previously been interviewed, but some potential data was missed. Being a distance learner made the research very reliant on others to distribute the questionnaire: it was possible to just keep going until enough people had responded but it took one month to collect responses.

It would have been beneficial:

- To have been in a position where the researcher could have been in more control of gathering responses rather than hoping the “snowball” would take effect;
- To have asked fewer questions in the questionnaire, especially questions that could be answered in free text because these were difficult to analyse quantifiably like the rest of the questionnaire;



- To not have thought of a fundamental question after having completed most interviews;
- To have been able to do more interviews in person;
- And to have had a larger, more random sample that involved more postgraduates and especially more academics.

## 6 RESULTS

### 6.1 SUMMARY OF FINDINGS

The study found that serendipity is understood by respondents in similar ways to the literature but remains a problematic term. Serendipity is linked to some personality traits, some information behaviour and both good and bad moods. Serendipity is not always remembered, but it is thought to be possible that one could train oneself to be more attune to it. People still find information by browsing bookshelves and it is possible to experience serendipity via the internet. A library can facilitate experiences of serendipity. A stigma still exists.

### 6.2 IS THE DESCRIPTION OF SERENDIPITY IN THE LITERATURE CONSISTENT WITH HOW IT IS DESCRIBED IN REAL LIFE?

find one thing and then another  
 fell into my lap  
 happened to come across  
 flew out of books  
 sudden  
 meant to be random somehow fuse  
 stumble upon out of nowhere  
 out of the blue  
 learning curve lucky  
 lightbulb moment  
 books which fell out of the shelf  
 came to my mind  
 cannot be planned

Lucky (no. 2)	Out of the blue (no. 4)	Cannot be planned (no. 2)
Random (no. 4)	Stumble upon (no. 4, no. 41)	find one thing and then another (no. 23)
Sudden (no. 4, no. 23, no. 29)	Flew out of books (no. 4, no. 29)	Came to my mind (no. 23)
Meant to be (no. 4, no. 29)	Happened to come across (no. 29, no. 49)	Fell into my lap (no. 29)
Lightbulb moment (no. 41)	Somehow fuse, without setting out to fuse them (no. 29)	Learning curve (no. 41)
Out of nowhere (no. 4)	Books which fell out of the shelf (no. 4)	

Figure 4 Summary of descriptions of serendipity by interviewees, which are remarkably similar to the literature (see Figure 1, p. 1).

## 6.3 WHY DO SOME PEOPLE EXPERIENCE SERENDIPITY MORE OFTEN THAN OTHERS? WHERE DOES THE 'KNACK' FOR ACCIDENTAL DISCOVERY COME FROM?

### 6.3.1 Personality? The five-factor model

Can serendipity be linked to any of the elements of the five-factor model of personality (emotional stability, extroversion, conscientiousness, agreeableness, openness)?

#### 6.3.1.1 Emotional stability

The questionnaire did not find conclusive evidence that people are more likely to experience serendipity if they are emotionally stable (confident, optimistic, clear-thinking and contented).

*Table 5 Summary of results for Question 2. How did you score on the question of emotional stability? (Cross-tabulated with the frequency with which respondents experience serendipity)*

2. How did you score on the question of <b>emotional stability</b> ?	13. How often do you experience serendipity?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Extremely low: very sensitive and empathetic	0	1 (7.1%)	2 (13.3%)	2 (11.1%)	0	<b>5</b>
Low: quite sensitive and empathetic	1 (100%)	3 (21.4%)	3 (20%)	4 (22.2%)	0	<b>11</b>
Just below average: a little sensitive and empathetic	0	4 (28.6%)	3 (20%)	5 (5.5%)	0	<b>12</b>
Average	0	2 (14.3%)	4 (26.6%)	3 (16.6%)	0	<b>9</b>
Just above average: a little calm and stable	0	0	0	1 (5.5%)	0	<b>1</b>
High: quite calm and stable	0	3 (21.4%)	3 (20%)	2 (11.1%)	0	<b>8</b>
Extremely high: very calm and stable	0	1 (7.1%)	0	1 (5.5%)	0	<b>2</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

### 6.3.1.2 Extroversion

The questionnaire found, with anomalies at the 'quite extroverted' level, that people are more likely to experience serendipity if they are extroverted.

*Table 6 Summary of results for Question 3 how did you score on the question of extroversion?  
(Cross-tabulated with the frequency with which respondents experience serendipity)*

3. How did you score on the question of <b>extroversion</b> ?	13. How often do you experience serendipity?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Extremely low: very introverted	0	0	3 (20%)	2 (11.1%)	0	<b>5</b>
Low: quite introverted	0	1 (7.1%)	4 (26.6%)	4 (22.2%)	0	<b>9</b>
Just below average: a little introverted	0	3 (21.4%)	2 (13.3%)	4 (22.2%)	0	<b>9</b>
Average	0	1 (7.1%)	2 (13.3%)	4 (22.2%)	0	<b>7</b>
Just above average: a little extroverted	1 (100%)	6 (42.9%)	2 (13.3%)	0	0	<b>9</b>
High: quite extroverted	0	2 (14.3%)	1 (6.6%)	3 (16.6%)	0	<b>6</b>
Extremely high: very extroverted	0	1 (7.1%)	1 (6.6%)	1 (5.5%)	0	<b>3</b>
<b>Totals</b>	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

### 6.3.1.3 Conscientiousness

With one anomaly at each end of the scale, the questionnaire found that the less frequently a person experienced serendipity, the more flexible they were.

*Table 7 Summary of results for Question 4. how did you score on the question of conscientiousness?  
(Cross-tabulated with the frequency with which respondents experience serendipity)*

4. How did you score on the question of conscientiousness?	13. How often do you come across information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Extremely low: very flexible	1 (100%)	0	1 (6.6%)	3 (16.6%)	0	<b>5</b>
Low: quite flexible	0	3 (21.4%)	2 (13.3%)	6 (33.3%)	0	<b>11</b>
Just below average: a little flexible	0	2 (14.3%)	5 (33.3%)	1 (5.5%)	0	<b>8</b>
Average	0	3 (21.4%)	3 (20%)	2 (11.1%)	0	<b>8</b>
Just above average: a little purposeful and careful	0	2 (14.3%)	2 (13.3%)	3 (16.6%)	0	<b>7</b>
High: quite purposeful and careful	0	4 (28.6%)	2 (13.3%)	2 (11.1%)	0	<b>8</b>
Extremely high: very purposeful and careful	0	0	0	1 (5.5%)	0	<b>1</b>
<b>Totals</b>	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

### 6.3.1.4 Agreeableness

The questionnaire indicates, with anomalies, that those who are people-minded tend to experience serendipity more often (often or very frequently) than those who are more task-orientated and business-like. 33.2% of 'occasionally' scored above average on this scale, compared with 46.6% at 'often' and 57.1% at 'very frequently'.

*Table 8 Summary of results for Question 5 how did you score on the question of agreeableness?  
(Cross-tabulated with the frequency with which respondents experience serendipity)*

5. How did you score on the question of <b>agreeableness</b> ?	13. How often do you come across information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Extremely low: very task-orientated and business-like (wary, pessimistic, impatient)	0	0	1 (6.6%)	1 (5.5%)	0	2
Low: quite task-orientated and business-like	1 (100%)	1 (7.1%)	3 (20%)	3 (16.6%)	0	8
Just below average: a little task-orientated and business-like	0	2 (14.3%)	1 (6.6%)	5 (27.7%)	0	8
Average	0	3 (21.4%)	3 (20%)	3 (16.6%)	0	9
Just above average: a little people-minded and attentive	0	3 (21.4%)	1 (6.6%)	3 (16.6%)	0	7
High: quite people-minded and attentive	0	3 (21.4%)	3 (20%)	1 (5.5%)	0	7
Extremely high: very people-minded and attentive (compassionate, good natured, intelligent)	0	2 (14.3%)	3 (20%)	2 (11.1%)	0	7
Totals	1	14	15	18	0	48

### 6.3.1.5 Openness

Like Heinström, a non-conclusive relationship was found between openness and serendipity.

*Table 9 Summary of results for Question 6. how did you score on the question of openness? (Cross-tabulated with the frequency with which respondents experience serendipity)*

6. How did you score on the question of <b>openness</b> ?	13. How often do you come across information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Extremely low: very open and polite	0	0	0	0	0	<b>0</b>
Low: quite open and polite	0	0	3 (20%)	1 (5.5%)	0	<b>4</b>
Just below average: a little open and polite	0	1 (7.1%)	4 (26.6%)	4 (22.2%)	0	<b>9</b>
Average	0	0	3 (20%)	6 (33.3%)	0	<b>9</b>
Just above average: a little original	1 (100%)	5 (35.7%)	2 (13.3%)	4 (22.2%)	0	<b>12</b>
High: quite original	0	5 (35.7%)	2 (13.3%)	2 (11.1%)	0	<b>9</b>
Extremely high: very original	0	3 (21.4%)	1 (6.6%) 33.2%	1 (5.5%) 38.8	0	<b>5</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

The interviewees had very different personalities, which indicated that the study used a varied dataset. These personalities did not fit Heinström's understanding of a serendipitous person according to the five-factor model (Table 10, p. 44), but they were still able to discuss the concept at length and described it in very similar ways to the literature (Figure 4, p. 38).

Table 10 Personalities of interviewees with the frequency with which they experience serendipity

Entry No.	13. How often do you experience serendipity?	Personality
2	Often	Emotional stability: low Extroversion: just below average Conscientious: averagely conscientious Agreeable: just below average Openness: high
4	Often	Emotional stability: just below average Extroversion: just below average Conscientiousness: just below average Agreeableness: averagely agreeable Openness: just below average
23	Often	Emotional stability: averagely emotionally stable Extroversion: Just above average Conscientiousness: just above average Agreeableness: extremely high Openness: just below average
29	Occasionally	Emotional stability: Averagely emotionally stable Extroversion: extremely low Conscientiousness: extremely low Agreeableness: Averagely agreeable Openness: Averagely open/original
30	Very frequently	Emotional stability: High Extroversion: just above average Conscientiousness: low Agreeableness: just above average Openness: extremely high
41	Often	Emotional stability high Extroversion: Averagely introvert/extrovert Conscientiousness: Averagely conscientious Agreeableness: Averagely agreeable Openness: low - Quite open and polite
42	Very frequently	Emotional stability: extremely high Extroversion: high Conscientiousness low Agreeableness low Openness just above average
49 (did not complete questionnaire)	"Fairly frequently"	"Because I'm exploring stuff and I suppose I'm open, I'm open to new ideas, I guess and I'm always thinking there may be a better way of doing it."



### 6.3.2 Information behaviour?

There is not a conclusive link between information literacy and serendipity (Table 11, p. 45). The largest percentage of respondents who always knew how to find the information they need experienced serendipity very frequently (21.4%). However, 88.8% of occasional experiencers of serendipity knew how to find the information they need most of the time compared with 71.4% at very frequently and 73.3% at often.

*Table 11 Summary of results for question 20 a. I know how to find the information I need, cross-tabulated with the frequency with which respondents experience serendipity.*

20.a. I know how to find the information I need	13. How often do you experience serendipity?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	0	0	0	0	<b>0</b>
Occasionally	0	1 (7.1%)	0	0	0	<b>1</b>
Sometimes	0	0	4 (26.6%)	1 (5.5%)	0	<b>5</b>
Most of the time	1 (100%)	10 (71.4%)	11 (73.3%)	16 (88.8%)	0	<b>38</b>
Always	0	3 (21.4%)	0	1 (5.5%)	0	<b>4</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

Generally, the more time you have to search for information (and by implication to think and reflect), the more likely you are to experience serendipity. The trend is shown in the data, apart from the exception where more of those who experience serendipity often are sometimes short of time (40%) than those who experience serendipity occasionally (22.2%).

*Table 12 Summary of results for question 20 b. I am short of time when searching for information, cross-tabulated with the frequency with which respondents experience serendipity*

<b>20.b. I am short of time when searching for information</b>	<b>Almost always</b>	<b>Very frequently</b>	<b>Often</b>	<b>Occasionally</b>	<b>Never</b>	<b>Totals</b>
Never	0	0	0	1 (5.5%)	0	<b>1</b>
Occasionally	0	5 (35.7%)	4 (26.6%)	3 (16.6%)	0	<b>12</b>
Sometimes	1 (100%)	4 (28.6%)	6 (40%)	4 (22.2%)	0	<b>15</b>
Most of the time	0	3 (21.4%)	5 (33.3%)	8 (44.4%)	0	<b>16</b>
Always	0	2 (14.3%)	0	2 (11.1%)	0	<b>4</b>
<b>Totals</b>	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

Unlike Ross (1999), it was found that those who read for pleasure were less likely to be serendipitous. 16 of occasional experiencers read for pleasure always or most of the time (88.8%). This falls to 12 for often (80%) and 11 for very frequently (78.6%) and zero for almost always.

*Table 13 Summary of results for Question 20.d. I like to read for pleasure, cross-tabulated with the frequency with which respondents experience serendipity*

20.d. I like to read for pleasure	13. How often do you experience serendipity?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	0	0	0	0	<b>0</b>
Occasionally	0	1 (7.1%)	3 (33.3%)	0	0	<b>4</b>
Sometimes	1	2 (14.3%)	0	2 (11.1%)	0	<b>5</b>
Most of the time	0	4 (28.6%)	4 (26.6%)	7 (38.8%)	0	<b>15</b>
Always	0	7 (50%)	8 (53.3%)	9 (50%)	0	<b>24</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

As expected, generally the more you search for inspiration and the more you search for new ideas, the more you experience serendipity.

*Table 14 Summary of results for Question 20. g. I search for inspiration, cross-tabulated with the frequency with which respondents experience serendipity*

20.g. I search for inspiration	13. How often do you come across information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	0	0	0	0	<b>0</b>
Occasionally	0	2 (14.3%)	0	1 (5.5%)	0	<b>3</b>
Sometimes	0	4 (28.6%)	8 (53.3%)	12 (66.6%)	0	<b>24</b>
Most of the time	0	6 (42.9%)	5 (33.3%)	3 (16.6%)	0	<b>14</b>
Always	1 (100%)	2 (14.3%)	2 (13.3%)	2 (11.1%)	0	<b>7</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

*Table 15 Summary of results for Question 20.h. I search for new ideas, cross-tabulated with the frequency with which respondents experience serendipity*

20.h. I search for new ideas	13. How often do you come across information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	0	0	0	0	<b>0</b>
Occasionally	0	1 (7.1%)	3 (20%)	2 (11.1%)	0	<b>6</b>
Sometimes	0	4 (28.6%)	6 (40%)	11 (61.1%)	0	<b>21</b>
Most of the time	0	7 (50%)	4 (26.6%)	4 (22.2%)	0	<b>15</b>
Always	1 (100%)	2 (14.3%)	2 (13.3%)	1 (5.5%)	0	<b>6</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

Those who experience serendipity very frequently are less likely to use the first information they find to save time.

*Table 16 Summary of results for Question 20. q. I like to use the first relevant information I find since it saves time, cross-tabulated with the frequency with which respondents experience serendipity*

20.q. I like to use the first relevant information I find since it saves time	13. How often do you come across information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	2 (14.3%)	0	0	0	<b>2</b>
Occasionally	0	7 (50%)	5 (33.3%)	7 (38.8%)	0	<b>19</b>
Sometimes	1 (100%)	3 (21.4%)	6 (40%)	7 (38.8%)	0	<b>17</b>
Most of the time	0	1 (7.1%)	3 (20%)	3 (16.6%)	0	<b>7</b>
Always	0	1 (7.1%)	1 (6.6%)	1 (5.5%)	0	<b>3</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

The more you enjoy searching for information, the more frequently you experience serendipity. 12 at very frequently enjoy searching for information either most of the time or always (85.7%). This falls to 7 at often (46.6%) and 6 at occasionally (33.3%). A link has been found here just like Heinström.

*Table 17 Summary of results for Question 20. t. I enjoy searching for information, cross-tabulated with the frequency with which respondents experience serendipity*

20.t. I enjoy searching for information	13. How often do you come across information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	0	0	1 (5.5%)	0	<b>1</b>
Occasionally	0	1 (7.1%)	5 (33.3%)	4 (22.2%)	0	<b>10</b>
Sometimes	0	1 (7.1%)	3 (20%)	7 (38.8%)	0	<b>11</b>
Most of the time	1	10 (71.2%)	5 (33.3%)	3 (16.6%)	0	<b>19</b>
Always	0	2 (14.3%)	2 (13.3%)	3 (16.6%)	0	<b>7</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

Investing time in reading was found to have a positive impact on serendipity, which suggests that the less time you invest in what you are reading, the less connected you are to it and the less likely you are to experience serendipity.

*Table 18 Summary of results to question 20. u. I read a book, journal or webpage in its entirety, cross-tabulated with the frequency with which respondents experience serendipity*

20.u. I read a book, journal or webpage in its entirety	13. How often do you come across information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	1 (7.1%)	2 (13.3%)	2 (11.1%)	0	<b>5</b>
Occasionally	0	3 (21.4%)	3 (20%)	9 (50%)	0	<b>15</b>
Sometimes	1 (100%)	7 (50%)	7 (46.6%)	5 (27.7%)	0	<b>20</b>
Most of the time	0	3 (21.4%)	3 (20%)	2 (11.1%)	0	<b>8</b>
Always	0	0	0	0	0	<b>0</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

People who experience serendipity very frequently are more likely to skim-read than those at often or occasionally. The majority of people at often and occasionally skim-read sometimes. This could be seen to contradict the idea that serendipitous people spend more time reading and searching for information, but it could equally be an indicator that these people are having contact with more information than those who experience serendipity less often.

*Table 19 Summary of responses to question 20. v. I skim-read, cross-tabulated with the frequency with which respondents experience serendipity*

20.v. I skim-read	13. How often do you come across information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	0	0	1 (5.5%)	0	<b>1</b>
Occasionally	0	3 (21.4%)	1 (6.6%)	1 (5.5%)	0	<b>5</b>
Sometimes	0	3 (21.4%)	9 (60%)	8 (44.4%)	0	<b>20</b>
Most of the time	1 (100%)	7 (50%)	5 (33.3%)	7 (38.8%)	0	<b>20</b>
Always	0	1 (7.1%)	0	1 (5.5%)	0	<b>2</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

In the questionnaire, interest in the subject does not seem linked to serendipity as most respondents liked to read around their subject. However, one interviewee maintained that:

The kind of book that I'm likely to read is also the kind of book that is likely to have a sort of element that might relate to my studies because I'm interested in philosophy...All the books that I read are going to be in some way connected to that, even if they're travel books... So it's kind of likely they're going to link together... the reason I met this guy was because we were both travelling... It didn't necessitate these things happening, but it made it possible for them to happen (no. 30).

#### **6.4 WHY DO PEOPLE THINK IT HAPPENS?**

Interviewees were often in a good mood when they experienced serendipity: they were feeling relaxed and were not busy. There was a belief that "you have to be in the right state of being to allow them to happen" (no. 4). As expected, serendipity had a pleasing, exciting and satisfying effect (c.f. McBirnie, 2008):



- When mushroom growing appeared in the exam, no. 29 felt “all was right with the world...hugely relieved [and] pleasant”.
- When no. 41 finally found the reports and what they contained, he “felt “justified” in “my topic of interest” – it was “exciting” and “I felt pretty rewarded with my efforts”. It “spurred me on the process [to] get it all written up.”
- No. 42 felt “relieved” and “quite pleased with myself”.
- No. 23 felt ““really good...I felt very happy. I thought it was a brilliant idea. And then I couldn’t understand why my colleagues weren’t as excited as I was...I told everyone straight away”.
- No. 30 found the experience “exciting” and “energising”.
- No. 49 will “pat myself on the back” and feel it was lucky that it worked. “It’s a kind of euphoric moment... Wow. It survived and actually, that looks really good there, so I’m really happy... I suppose I just then accept it, and it’s the norm suddenly”.
- The only people who attached any negativity to serendipity were no. 4, who although tends to feel “really excited”, “speechless” and surprised, has “mixed feelings” as she feels “a little bit scared too [because it’s] so connected to what I’ve been thinking about”; and no. 49, who described panic and indecision:

“Oh my God, shall I move you over there? That’s where I intended you to go, but you’re doing really well over there in that space”, so... and then I might have a kind of query then and “oh my God, what do I do? Cos that worked so well and I wasn’t expecting that. Do I ruin that?”

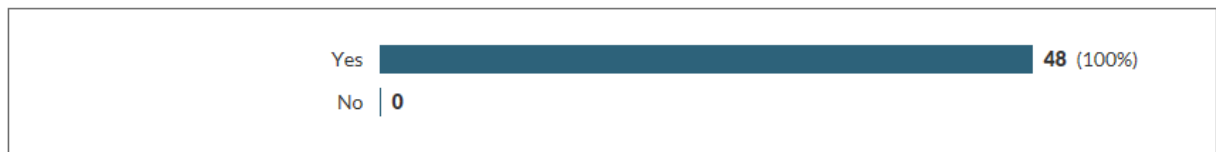
Serendipity was also found to happen, in contradiction of Makri and Blandford (2012a), when respondents were feeling desperate and frantic because they urgently needed an idea for an assignment (no. 2), or were bored (no. 42), frustrated (no. 41 and 42), lost (no. 23) or terrified (no. 29). As expected, respondents did not generally think it was possible to look for serendipity, to “look for chance” (no. 42). Serendipity was thought to happen because of a slow pace of life, because you attract those things you are seeking to find, from being in a receptive mood, being persistent and having an imaginative, inquisitive approach to life.

## 6.5 WHY IS SERENDIPITY NOT ALWAYS REMEMBERED?

Serendipity happens to everyone (Figure 5, p. 54). However, although all respondents had discovered useful, interesting, helpful or productive information by accident, responses were split over whether respondents could remember a specific instance where this happened (Table 20, p. 54).

*Figure 5 Summary of results for Question 11. Have you ever discovered useful, interesting, helpful or productive information you weren't looking for?*

**11** Have you ever discovered useful, interesting, helpful or productive information you weren't looking for?



*Table 20 Summary of results to question 12. Can you think of a specific example of an instance where you had a creative idea or discovered information unexpectedly? (Cross-tabulated with the frequency with which respondents experience serendipity)*

12. Can you think of a specific example of an instance where you had a creative idea or discovered information unexpectedly?	13. How often do you discover information by accident?					Totals
	Almost always	Very frequently	Often	Occasionally	Never	
Yes	1 (4.8%)	7 (33.3%)	8 (38.1%)	5 (23.8%)	0	21 (43.8%)
No	0	7 (25.9%)	7 (25.9%)	13 (48.1%)	0	27 (56.3%)

## 6.6 IS SERENDIPITY SOMETHING THAT CAN BE LEARNT?

It was thought that serendipity could be learnt, but not directly, for “how can getting an idea be learned” (no. 23)? You could learn:

- not to “subconsciously skip over bits of information that could actually be useful” (no. 2);
- to “train yourself to be more open” (no. 2, no. 23);
- to “learn to notice when it’s happened” (no. 29);

- “learn to put yourself in situations” where you are likely to be exposed to “lots of different stimuluses” (no. 30);
- to be more “thorough” (no. 41) but less “focussed” and learn not to “just kind of hammer through an idea until they find the right thing” (no. 42);
- to learn to be less scared by it, according to no. 4, who is less scared now because “it happens every day to me” and no. 23, who suggests: “maybe people could be taught not to be scared of having crazy ideas”.

## 6.7 DOES A DESIRE FOR SERENDIPITY MOTIVATE PEOPLE TO FIND INFORMATION?

Some motivation for finding information does not seem greatly linked to serendipity:

*Table 21 Motivation for finding information that did not involve serendipity*

Motivation	No. of respondents motivated in this way	Comments
Work	13	<ul style="list-style-type: none"> <li>• To complete assignments</li> <li>• To meet deadlines</li> <li>• To do my job effectively</li> <li>• “Be prepared” for questions students might ask them (no. 27)</li> <li>• “Get good marks” (no. 44)</li> </ul>
Complete a task	6	<ul style="list-style-type: none"> <li>• A need “to answer questions”</li> <li>• A need to “find a project to fill a brief” (no. 39)</li> </ul>
Other people	4	<ul style="list-style-type: none"> <li>• “Discussions with other people” (no. 43 and 45)</li> <li>• To gain “a greater understanding of other people” (no. 30)</li> </ul>
Competitiveness	1	<ul style="list-style-type: none"> <li>• “A drive to be the best or beat someone else” (no. 32).</li> </ul>
Enjoyment	1	-
Boredom	1	-

Some responses seemed especially serendipitous, in that they were clearly looking for something intangible.

*Table 22 Motivation for finding information that did involve serendipity*

<b>Motivation</b>	<b>No. of respondents motivated in this way</b>	<b>Comments</b>
Desire for knowledge	13	<ul style="list-style-type: none"> <li>• “Thirst for knowledge” (no. 34)</li> <li>• “Desire for knowledge” (no. 23)</li> <li>• “To know more about something” (no. 10)</li> <li>• “Discovering and learning new things” (no. 35)</li> <li>• “A sense that I ought to know more” (no. 36);</li> </ul>
Curiosity	8	-
Satisfaction	6	-
Interest in the world	5	<ul style="list-style-type: none"> <li>• “General interest in the world at large” (no. 37)</li> <li>• “Desire to understand how the world works” (no. 38)</li> </ul>
Inspiration	5	<ul style="list-style-type: none"> <li>• “Looking for new ideas” (no. 16)</li> <li>• Looking for “an original edge to my work” (no. 34)</li> <li>• Looking for “the novel facts or data which gives me a 'lightbulb' moment in my work” (no. 41)</li> </ul>
Interest	3	-
Making connections	1	-
Not knowing	1	-

## 6.8 DOES A PREFERENCE FOR A PARTICULAR LEARNING STYLE MAKE YOU 'SERENDIPITY-PRONE' (MERTON AND BARBER, 2004)?

Learning by doing becomes more popular the less frequently people experience serendipity. Perhaps this is because learning by doing involves practical work and focused tasks with less time for reflection.

*Table 23 Summary of results for Question 18.c. I prefer to learn by doing, cross-tabulated with the frequency with which respondents experience serendipity*

18.c. I prefer to learn by doing (for example physical activity, field trips and first-hand experience).	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
I like to learn in this way	1 (2.6%)	8 (20.5%)	13 (33.3%)	17 (43.6%)	0	39

A preference for group work also has a negative effect, although the trend here is not consistent at the occasionally/often end of the scale.

*Table 24 Summary of results for Question 18.i. I learn by helping others and I prefer to work in groups. I prefer tasks which have a personal connection, cross-tabulated with the frequency with which respondents experience serendipity*

18.i. I learn by helping others and like to work in groups. I prefer tasks which have a personal connection.	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
I like to learn in this way	1 (4.2%)	4 (16.6%)	11 (45.8%)	8 (33.3%)	0	24

For other learning styles there was no apparent trend even those that were expected to have a link (preferring to study alone, being interested in big ideas and being flexible, open and enjoying discovering new information).

*Table 25 Summary of results for Question 18.e. I prefer to study alone, to listen to others talk and think about it privately and to think about something first and try it later, cross-tabulated with the frequency with which respondents experience serendipity*

18.e. I prefer to study alone, to listen to others talk and think about it privately and to think about something first and try it later.	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
I like to learn in this way	1 (2.5%)	12 (30%)	14 (35%)	13 (32.5%)	0	40

*Table 26 Summary of results for Question 18.g. I like reading and listening, using my imagination to solve problems and starting new projects. I am more interested in big ideas than in little details, cross-tabulated with the frequency with which respondents experience serendipity*

18.g. I like reading and listening, using my imagination to solve problems and starting new projects. I am more interested in big ideas than in little details.	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
I like to learn in this way	1 (3%)	10 (30.3%)	11 (33.3%)	11 (33%)	0	33

*Table 27 Summary of results for Question 18.k. I am flexible and open to new experiences in learning. I like to make choices. I work best when the work is fun and I like to discover new information, cross-tabulated with the frequency with which respondents experience serendipity*

18.k. I am flexible and open to new experiences in learning. I like to make choices. I work best when the work is fun and I like to discover new information.	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
I like to learn in this way	1 (2.4%)	13 (31.7%)	12 (29.3%)	15 (37%)	0	41

## 6.9 IS SERENDIPITY MORE LIKELY TO OCCUR WITH OR WITHOUT A SEARCH STRATEGY?

The questionnaire did not link either the use or absence of a search strategy to serendipity.

*Table 28 Summary of responses for Question 20.e. I search for specific answers to questions, cross-tabulated with the frequency with which respondents experience serendipity*

20.e. I search for specific answers to questions	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	0	0	0	0	<b>0</b>
Occasionally	0	1 (7.1%)	1 (6.6%)	1 (5.5%)	0	<b>3</b>
Sometimes	0	6 (42.9%)	3 (20%)	7 (38.8%)	0	<b>16</b>
Most of the time	0	5 (35.7%)	11 (73.3%)	9 (50%)	0	<b>25</b>
Always	1 (100%)	2 (14.3%)	0	1 (5.5%)	0	<b>4</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

*Table 29 Summary of results for Question 20.f. I search for information for a purpose, cross-tabulated with the frequency with which respondents experience serendipity*

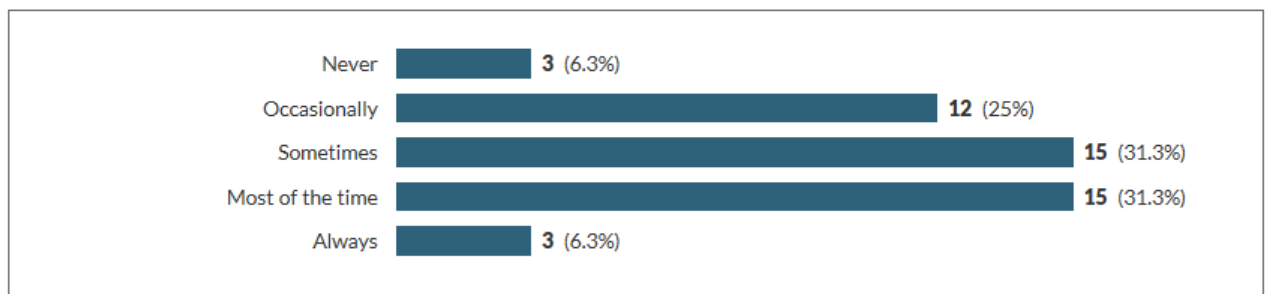
20.f. I search for information for a purpose	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	0	0	0	0	<b>0</b>
Occasionally	0	1 (7.1%)	0	1 (5.5%)	0	<b>2</b>
Sometimes	1 (100%)	4 (28.6%)	6 (40%)	5 (27.7%)	0	<b>16</b>
Most of the time	0	7 (50%)	8 (53.3%)	12 (66.6%)	0	<b>27</b>
Always	0	2 (14.3%)	1 (6.6%)	0	0	<b>3</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

*Table 30 Summary of results for Question 20.i. I have a plan for conducting my research before I start searching, cross-tabulated with the frequency with which respondents experience serendipity*

20.i. I have a plan for conducting my research before I start searching	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	1 (7.1%)	0	1	0	<b>2</b>
Occasionally	1 (100%)	5 (35.7%)	5 (33.3%)	10 (55.5%)	0	<b>21</b>
Sometimes	0	2 (14.3%)	6 (40%)	3 (16.6%)	0	<b>11</b>
Most of the time	0	4 (28.6%)	4 (26.6%)	3 (16.6%)	0	<b>11</b>
Always	0	2 (14.3%)	0	1 (5.5%)	0	<b>3</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

*Table 31 Summary of results for Question 20.p. It is better to find information for my studies through a planned search strategy than by accident, then cross-tabulated with the frequency with which respondents experience serendipity*

It is better to find information for my studies through a planned search strategy than by accident





20.p. It is better to find information for my studies through a planned search strategy than by accident	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	2 (14.3%)	1 (6.6%)	0	0	<b>3</b>
Occasionally	0	4 (28.6%)	3 (20%)	5 (27.7%)	0	<b>12</b>
Sometimes	1 (100%)	5 (35.7%)	6 (40%)	3 (16.6%)	0	<b>15</b>
Most of the time	0	1 (7.1%)	5 (33.3%)	9 (50%)	0	<b>15</b>
Always	0	2 (14.3%)	0	1 (5.5%)	0	<b>3</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

### 6.10 DOES FINDING INFORMATION ACCIDENTALLY BY BROWSING STILL HAPPEN? OR ARE PEOPLE MORE LIKELY, IN THIS DIGITAL AGE, TO EXPERIENCE SERENDIPITY THROUGH DIGITAL MEDIA THAN THROUGH TRADITIONAL METHODS OF INFORMATION SEEKING?

Google and the Internet were more popular as methods of searching for information than more traditional methods of searching. However, many still browse bookshelves and some found information unexpectedly using this method. Most thought highly of the internet's role in serendipity.

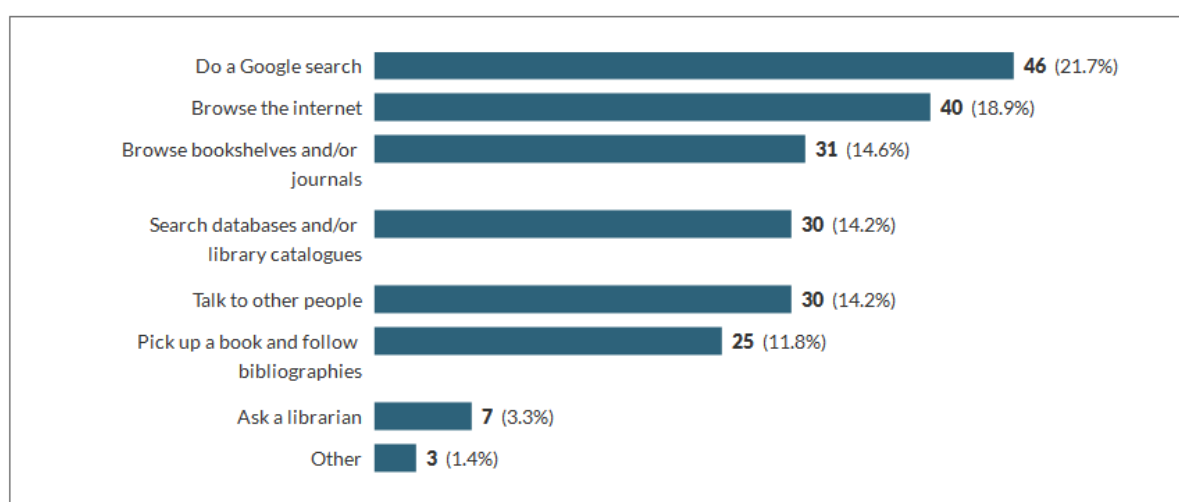


Figure 6 Answers to question 17 of the survey: When searching for information, I...

Table 32 Preferred method of seeking information

Method	Number of preferences	Comments
Searching for information	13 (16.6%)	-
Searching databases and library catalogues	9 (11.5%)	<ul style="list-style-type: none"> <li>This method was only preferred for “specific information” (no. 39), because “you can approach them methodically and filter results precisely” and to avoid spending “unnecessary time...reading around the subject” (no. 3)</li> </ul>
Search Google Scholar	2 (2.6%)	<ul style="list-style-type: none"> <li>“It is easy to perform searches from home or from my office, and because all the journals are indexed it is more efficient than searching [other databases]”</li> </ul>
Browsing for information	8 (10.3%)	-
Browse the internet	6 (7.7%)	<ul style="list-style-type: none"> <li>Because of the “masses of information available” (no. 28) and because you can access the information on the move, “without the inconvenience of travelling to a static library” (no. 1).</li> </ul>
Browse bookshelves	3 (3.8%)	<ul style="list-style-type: none"> <li>“wandering around [and] picking up books” (no. 29)</li> <li>“you feel like you’re in a maze” (no. 46)</li> <li>“you can often find useful things which you weren't really looking for, which isn't the case with more specific methods of searching” (no. 35)</li> <li>“using catalogues etc. I can only really follow what I was specifically thinking about already” (no. 20)</li> </ul>
Prefer Google	19 (24.4%)	<ul style="list-style-type: none"> <li>“Faster and easier”</li> <li>“It is always available and I can find answers quickly”</li> <li>“Convenience”</li> </ul>
Prefer the internet	5 (6.4%)	<ul style="list-style-type: none"> <li>“You're more likely to find information you didn't know before”</li> </ul>
Talk to others	5 (6.4%)	<ul style="list-style-type: none"> <li>“I love human interaction”</li> <li>“I prefer to ask people - there is so much information out there that I haven't got a hope of understanding it all, but I</li> </ul>

		am happy if I can understand just a small part and be able to relate it to someone I know, and perhaps be able to talk about it with them.”
Ask librarian	2 (2.6%)	<ul style="list-style-type: none"> <li>• “If it's a general query then a librarian could probably be helpful”</li> </ul>
Use the glossary of a textbook	1 (1.3%)	<ul style="list-style-type: none"> <li>• “As I know that the information is reliable enough to be published/ I would only have a textbook written by a reliable source. Find internet research very open ended, unreliable and frustrating”</li> </ul>
Varies depending on the purpose of the information	5 (6.4%)	<ul style="list-style-type: none"> <li>• “I like google searches for sparking ideas, but when I'm stuck for time and want something I know will be useful I tend to go via books and journals, or via tutors' recommendations to save time.”</li> <li>• “If I am finding information on a mathematical technique or a topic that is for my own interest, or something that I am going to go into more detail in later on, I might look at youtube to find lectures or demos.”</li> <li>• “For academic purposes I prefer to use databases and library catalogues, although I like browsing bookshelves or the internet.”</li> <li>• “Depends on what the information is and why I need it”</li> </ul>

*Table 33 Comparison between the number of respondents who come across information by browsing library shelves and the number of respondents who come across information by browsing the internet*

I come across information by browsing the internet	I come across information by browsing library shelves					
	Never	Occasionally	Sometimes	Most of the time	Always	Totals
Never	0	0	0	0	0	<b>0</b>
Occasionally	0	1	0	0	0	<b>1</b>
Sometimes	1	4	9	1	0	<b>15</b>
Most of the time	6	12	4	6	0	<b>28</b>
Always	2	1	0	0	1	<b>4</b>
Totals	<b>9</b>	<b>18</b>	<b>13</b>	<b>7</b>	<b>1</b>	<b>48</b>



Table 34 Summary of results for Question 20.j. I come across information by browsing library shelves, cross-tabulated with the frequency with which respondents experience serendipity

20.j. I come across information by browsing library shelves	13. How often do you come across information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	2 (14.3%)	4 (26.6%)	3 (16.6%)	0	<b>9</b>
Occasionally	1 (100%)	6 (42.9%)	4 (26.6%)	7 (38.8%)	0	<b>18</b>
Sometimes	0	3 (21.4%)	4 (26.6%)	6 (33.3%)	0	<b>13</b>
Most of the time	0	3 (21.4%)	2 (13.3%)	2 (11.1%)	0	<b>7</b>
Always	0	0	1 (6.6%)	0	0	<b>1</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

Table 35 Summary of results for Question 20.k. I come across information by browsing the internet, cross-tabulated with the frequency with which respondents experience serendipity

20.k. I come across information by browsing the internet	13. How often do you come across information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	0	0	0	0	<b>0</b>
Occasionally	0	0	0	1 (5.5%)	0	<b>1</b>
Sometimes	0	1 (7.1%)	3 (20%)	11 (61.1%)	0	<b>15</b>
Most of the time	1 (2%)	11 (78.6%)	10 (66.6%)	6 (33.3%)	0	<b>28</b>
Always	0	2 (14.3%)	2 (13.3%)	0	0	<b>4</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

*Table 36 Summary of results for Question 16 Have you ever discovered information accidentally when using a computer, tablet, mobile or other electronic device?*

<b>16. Have you ever discovered information accidentally when using a computer, tablet, mobile or other electronic device?</b>			
<b>Yes:</b>		97.9%	47
<b>No:</b>		2.1%	1

### **6.11 CAN A LIBRARY FACILITATE SERENDIPITY? IS THERE ANYTHING A LIBRARY OR INFORMATION SERVICE COULD DO TO HELP USERS FIND INFORMATION IN THIS WAY?**

Respondents were “certain” (no. 29) that a library can facilitate serendipity, referring to the layout of the library and the classification system used. They suggested a catalogue could direct a user to other useful sources by suggesting recommendations in a similar way to the targeted advertising found on websites.






### **6.12 IS SERENDIPITY IN RESEARCH MORE LIKELY TO OCCUR IN AN INFORMATION-RICH ENVIRONMENT, SUCH AS A LIBRARY OR THE INTERNET?**

Respondents gave diverse examples in the questionnaire and many of them did occur in a library or information environment. The results show that serendipity can come from activity (reading, watching videos, browsing Facebook or looking at art), thinking creatively, by chance, by doing the right preparation for an exam (as with no. 29) or happening to do research in the right location (as with no. 41). It can happen when you are on your own or in a group.

### **6.13 SERENDIPITY’S STIGMA**

Although nearly all (91.7%) would tell people how they found information if they found it by accident, not all thought the accidental discovery of information was respected (Table 37, p. 66). Most would not feel ashamed to tell others, but four (8.3%) would not tell others that a discovery was accidental and eight (16.7%) felt serendipity was not respected in their subject. This was because it was felt it would be “disregarded” (no. 6), because in science “there is not much room for out of the box thinking” (no. 19) or because of the need for evidence for new findings (no. 45).

*Table 37 Summary of results to Question 15 Within your subject, do you think discovering information by accident is respected? And Question 15. a. Would you tell people how you found information if you found it by accident?*

<b>15. Within your subject, do you think discovering information by accident is respected?</b>			
<b>Yes:</b>		54.2%	26
<b>No:</b>		16.7%	8
<b>Don't know:</b>		29.2%	14
<b>15.a. Would you tell people how you found information if you found it by accident?</b>			
<b>Yes:</b>		91.7%	44
<b>No:</b>		8.3%	4

## 7 DISCUSSION

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### 7.1 IS THE DESCRIPTION OF SERENDIPITY IN THE LITERATURE CONSISTENT WITH HOW IT IS DESCRIBED IN REAL LIFE?

The interviewees described serendipity in similar ways to each other and to the literature. They used similar language (“lucky” (no. 2), “random” (no. 4), “sudden” (no. 4, no. 23, no. 29), “meant to be” (no. 4, no. 49) and “lightbulb moment” (no. 41). They considered it, as in the literature, as something that cannot be planned (no. 2) (cf. Foster and Ford, 2003), where you would “find one thing and then another” (no. 23) (c.f. “one clue would lead to another clue” (Nutefall and Ryder, 2010, p. 231)). Serendipity, whether in study or in everyday life, is something which comes “out of nowhere” (no. 4) and “out of the blue” (no. 4) (cf. Rubin, 2010). Interviewees described ideas which “came to my mind” (no. 23), “fell into my lap” or “somehow fuse” without “[setting] out to fuse them” (no. 29), books which “fell out” of the shelf (no. 4), letters and photographs that “flew out” of books (no. 4, no. 29) and things they just “stumble upon” (no. 4, no. 41) or “happened to come across” (no. 29, no. 49). Serendipity was seen as a learning curve for teaching (no. 49) (c.f. Sun, Sharples and Makri, 2011) and as a positive experience (c.f. Nutefall and Ryder, 2010; McBirnie, 2008):

When you finally stumbling across something that is like the holy grail almost within its context of what you were looking for, it’s hard not to feel something light up inside you that is that kind of moment appreciating when you’ve found it, and actually realising that all the time you spent looking through the other things is somehow worth it now because it’s led you to it (no. 41).

Everyday life experiences could take longer to be appreciated and sometimes occurred less randomly. For no. 41, in everyday life it took longer for him/her to realise “the importance of it” and s/he has had longer to “appreciate” what happened in a way that is different from the “initial reaction” of having “uncovered something”: “it’s only perhaps in hindsight that I’ve been able to appreciate it more” (c.f. Csikszentmihalyi and Saywer, 1996; McCay-Peet and Toms, 2010; and Makri and Blandford, 2012a). McCay-Peet and Toms (2009) consider that serendipity can be a dangerous diversion from work which leads to unproductiveness. However, no. 30

seemed quite happy to be distracted as it led to a serendipitous discovery, while only no. 4 and no. 49 attached any negativity to serendipity, by describing how s/he is sometimes “scared by it” (no. 4) and by describing a sense of panic (no. 49).

### **7.1.1 A problematic term**

As expected, the term serendipity was just as confusing as the literature would have us believe. Although half of interviewees recognised the serendipity straight away, others:

- Only thought of their experience in terms of serendipity when they were asked to think of something in the questionnaire (no. 23);
- Had an instant reaction to what happened, but “hadn’t thought of it in terms of serendipity or anything else” (no. 42);
- Questioned whether what had happened to them was serendipity (“it was more that I came across something which for a long time had mildly interested me and then it suddenly turned into something completely different” (no. 29) and thinking about things in an abstract way is “kind of something we’re encouraged to do all the time” (no. 2));
- Responded better to questions using alternative words such as “significant” rather than serendipity (no. 29);
- Found the word serendipity difficult because although the concepts luck and coincidence exist, “the idea of serendipity doesn’t really exist in Italy...it is expressed in another way” (no. 23);
- Or were not sure
 

If I understand the word. I’ve heard the word but I never really knew what it meant until I spoke to you about it...I suppose yes I must’ve [realised it was serendipity straight away], but at the time I didn’t know the word, so that word serendipity never came into my head (no. 49).

## **7.2 WHY DO SOME PEOPLE EXPERIENCE SERENDIPITY MORE OFTEN THAN OTHERS? WHERE DOES THE ‘KNACK’ FOR ACCIDENTAL DISCOVERY COME FROM?**

In terms of the five-factor model, Tables 5-9 (pp. 39-43) show that people who experienced serendipity frequently were generally extroverts (c.f. Heinström, 2006; McCay-Peet and Toms, 2015; and McCay-Peet, Toms and Kelloway, 2015) and agreeable (c.f. Heinström, 2006). Like Heinström (2002 and 2006), a non-conclusive relationship was found between openness to experience and serendipity. Although



93.3% of very frequent experiencers scored highly on this scale, occasional experiencers of serendipity were more original than those who experienced serendipity often (38.8% of occasional experiencers scored above average on the scale compared to 33.2% at often) (Table 9, p. 43). As expected, those who experienced serendipity frequently were people who enjoyed searching for information, were more likely to skim-read, were less likely to use the first information they found to save time, were less likely to search for information for a purpose, and were people who searched for information and new ideas, and had time both to search for information and to invest in what they were reading (Tables 11-19).

However, in other areas the results were not as Heinström would expect. Those who experienced serendipity more frequently were not found to be more information literate, to read for pleasure or have a great interest in the subject. McBirnie, Heinström and Krotoski consider focus to have a negative effect on serendipity (see p. 21). However, Table 7 (p. 41) shows that those who experienced serendipity less often were more likely to be flexible. Nor were frequent experiences of serendipity linked to emotional stability. Heinström (2006) considers that people are more likely to experience serendipity if they are emotionally stable. However, in the study, at both 'very frequently' and 'often' just as many people had high levels of this trait as low levels of this trait (~20%) (Table 5, p. 39). If anything, those who experienced serendipity less were more emotionally stable.

Eight entirely different conversations about serendipity took place, working from the same interview guide. None of the personalities of the interviewees completely fitted Heinström's understanding of a serendipitous person according to the five-factor model, but they were still able to discuss the concept at length and described it in very similar ways to the literature (Figure 4, p. 38). No. 4 did not score above average on any scale, yet s/he experienced serendipity often and had a thoroughly good understanding of the concept. No. 2 scored highly for openness but low-average with the other four factors; no. 41 was highly emotionally stable, fairly cautious and otherwise average; no. 23 experiences serendipity just as often as 2, 4 and 41 but was extremely agreeable and otherwise average—just above average. No. 29 experienced serendipity occasionally (the least frequently of the interviewees), scored between low and average on four factors and was extremely introverted. No. 30 experienced serendipity very frequently, was highly emotional

stable, extremely open and very flexible, but was only just above averagely extroverted and agreeable. No. 42 experienced serendipity just as frequently but did not share the same characteristics: s/he was very emotionally stable, highly extroverted, flexible, above averagely open but highly neurotic.

Heinström (2010) acknowledges herself that studying personality “is far from deterministic and human reactions can never be foreseen with certainty...we are certainly no programmed robots designed for one reaction only...personality traits are in fact poor predictors of behaviour” (p. 4 and 7). And although her use of the five-factor model would suggest that she would expect a serendipitous person to have certain characteristics, Heinström does admit that:

There is certainly not one single personality type which would form the ‘ideal’ information literate citizen. Quite the contrary, different traits may prove useful in different situations. A comprehension of how different traits come into play in information seeking would increase the understanding of users of information services (Heinström, 2003, introduction, para. 1).

She is not alone: Foster and Urquhart (2012) warn that “as with all personality identification, caution is necessary” (p. 798) (c.f. Gleitman, Fridlund and Reisberg, 1999, p. 695; Snyder, 1987).

### **7.3 WHY DO PEOPLE THINK IT HAPPENS?**

In support of Makri and Blandford (2012a), interviewees were often “in a good mood” (no. 23) when they experienced serendipity. As argued by Csikszentmihalyi and Saywer (1996) and McCay-Peet and Toms (2010), serendipity happened when respondents were feeling relaxed (no. 29, no. 49, no. 4) and were not busy. No. 2 was “just browsing the internet... not really with an aim...just jumping around... I think that day I’d spent a lot of time in my room making like mind maps of books”. No. 23 was “having a chat...we were just finishing our shifts” when she thought about moving books into the corridor. No. 49 was on a lunch break when she discovered a method for a homemade pesticide at the back of a library book by chance. No. 29 “*wasn’t really looking*, I just happened to be at home, *vaguely* sort of muck about, took it out and just looked at it [a letter which “flew” out of a bible]”. No. 30 was just reading in the:

Lazy post-Christmas period...when I read, I was just very casually, I was just having a cup of tea and I was leafing through this book and thought oh this

section, when I read it, had this rather intriguing title – I wasn't thinking about my course at all...it was just this perfect counterpoint to this sort of philosophical point that David Hume had been making. And obviously *it then became the centrepiece*, the central piece of evidence as it were in my essay. Again, it was two sort of things that were completely unrelated... And they happened at the same time.

These are, in the researcher's mind, typical conditions for serendipity: s/he was not thinking about Hume at the time, s/he was casually "leafing" through the book, relaxed, in the "lazy post-Christmas period" having a cup of tea. It was fortuitous that s/he read it when he did because if s/he had read it sooner or later, the outcome would probably not have been serendipity. No. 42's experience with finding the article in the newspaper similarly meant s/he "pretty much based [his/her] essay on it".

No. 4 believed that "you have to be in the right state of being to allow them to happen":

You need to be in a calm state of being, not quite stressed out thinking about the thing that you want to find but just kind of relaxed and not thinking about it and just letting it happen to you, just letting this information come to you *out of magically somewhere*... it's the difference between people who are very patient and intuitive that can see meaning and connection and really acknowledge these coincidence things that they come across and connect to them more deeply than someone who says, is a little more impatient and fast-paced. I'm sure coincidental things come to them but they're so busy and they don't think so deeply and they're not as patient and intuitive to feeling connections so much. These things pass them by and they just continue on with their lives so that's where I think there's a difference between these two kinds of people. It's not just two kinds of people, I mean it could be two kinds of states of being.

No. 4's comments about "fast-paced" people supports McBirnie's (2008) idea that it is possible to close your mind and filter out serendipity when "the individual considers they are too busy to be distracted" (p. 608).

No. 4 before serendipity is:

At a state of being where I'm not thinking about these things but they're in the back of my mind cos I do want to find them and I'm kind of really calm and almost kind of meditative... I'm not really thinking about anything, I'm just kind of there doing something else then it just happens upon... I'm feeling calm and I'm not searching for them... I'm doing regular things...where I'm not thinking deeply and I'm not stressed I'm just calmly doing regular things... these coincidences come when you think, *when you kind of give up, when you*

*stop thinking* and then all of a sudden it appears to you *out of the blue* (c.f. Rubin, 2010).

It was unexpected that respondents would have such firm convictions. The confusion that came from the term serendipity was far more expected. No. 4 was able to argue in depth and very convincingly that “you have to be in the right state of being to allow [serendipitous experiences] to happen”. No 30 was similarly adamant that “it happens so often that it can’t be luck, I don’t believe in fate, so there must be an element of it’s just to do with the imagination”. If no. 29 gets stuck in the process of doing research, s/he will stop, forget about it and walk around to rest his/her mind and get to the “mental space” needed “to start looking elsewhere”. In contrast, no. 2 suggests that it can be helpful to be in an academic bubble, to be “carrying around your work with you in everyday life... in a way that means that you don’t switch off from it”. S/he has conversations with friends who are studying similar things which led to serendipitously useful conversations. The impact of the academic bubble on serendipity was unexpected but it does make sense: if you are already predisposed to be thinking about something, you are more likely to notice something that connects with it when it happens.

Serendipity can, however, happen when you are not in this frame of mind. Interviewees described serendipitous experiences when s/he was feeling “desperate” and “frantic” because s/he needed an idea for something to write about (no. 2), “lost” (no. 23), “frustrated” (no. 41 and 42) and “was starting to get a bit annoyed... wondering whether there would be information that would just produce the same findings that had been shown already and that it wasn’t necessarily a worthwhile topic” (no. 41), “bored” (no. 42), in a state of “confusion... I’m not really sure what to do... I’m rushing it, and then I do it and then, like I say, I usually forget about it, because I probably do loads of other things” (no. 49) and when feeling “terrified” before the exam (no. 29), “but I was fine, thanks to losing my notes [on a London tube], in fact”. It was not expected that serendipity could happen when one was in such a negative mindset.

No. 4 thought serendipity happened because of a slow pace of life: “[I am] a bit more patient and slower paced and intuitive, [so] I notice these things” and due to “fate”. S/he referred to the law of attraction, where:

Something that has been on your mind, something you have been deeply thinking about – you attract things towards that through some kind of energy...and so you think that it's a coincidence that these things that you've been thinking about have come to you, but really it's because you've been thinking about them that they have come to you.

No. 2 agreed, referring to the idea of confirmation bias, where “you look for the facts that you want to find”. Does this stop it being serendipitous? Is it serendipity if it happens a lot? No. 30 questioned whether what happens to him is serendipity because “this sort of thing seems to happen so reliably often”. Others put it down to “not looking for specific things very much” (no. 42), being “in a particularly receptive mood beforehand” (no. 29) and having the “persistence...to carry on looking, [to] have that unerring curiosity to carry on” (no. 41).

In contrast, no. 4 believed stressed and worried people do not see experiences as serendipitous (c.f. Makri and Blandford, 2012a and Krotoski, 2012):

People who are stressed out and worrying and thinking too much about something, they're unable to open up to those moments or they explain them too much, like if they think that they don't see it as serendipity, they see it as something that they're in control of, they were the ones that found the item, they don't see that as a serendipitous moment because it was something they wanted and they found it, so they don't realise, they don't see the randomness in it so much (no. 4).

It is also possible that we miss serendipity: we “don't recognise non-connections” (no. 30, c.f. Van Andel, 1994). Makri et al. (2014) found that one “could have easily been engrossed or not looking...and then it wouldn't have happened” (p. 2188). We do not see the missed opportunities, the negative serendipity (Van Andel, 1994), the serendipity lost (Barber and Fox, 1958) or what could have been.

#### **7.4 WHY IS SERENDIPITY NOT ALWAYS REMEMBERED?**

Table 20 (p. 54) shows that if you experience serendipity very frequently or often, you are more likely to be able to recall instances where it happened. As expected, a greater percentage of people who experienced serendipity occasionally could not recall an instance of serendipity (48.1%) than those who could (23.8%) and this was reversed for those who experienced serendipity more frequently. Respondents were occasionally very vague about what they had experienced: when asked to describe the instance of serendipity, one's comment was simply “looking up research for my assignments”; while another said they “can't think of any at present”. This tallies with

Foster and Urquhart (2012) who experienced coding difficulties when “transcripts indicated some serendipity but lacked sufficient detail”, particularly the “less descriptive answers” such as “I found some websites”. Serendipity was either very memorable (no. 29 could describe an example in some detail years after the event) or easily forgotten because “it’s just important for the moment, but it’s not really significant for your whole future or anything” (no. 4) or because the individual was focused at the time on something else. No. 2:

had become so entrenched into doing something in a particular way... so maybe that’s why you then forget it again afterwards because you’re not trained to look for it before, you didn’t know it was coming, you hear it and you’re like ‘oh that’s really interesting’ but if your brain is already stuck in like a different way of thinking about whatever it was then maybe you don’t remember it as much, unless write it down or something.

Serendipity was not expected to be so easily forgettable: it was expected that serendipity would have more of an impact on more people’s lives, but perhaps if it happens more often it is less significant.

## **7.5 IS SERENDIPITY SOMETHING THAT CAN BE LEARNT?**

The responses showed a belief that you can train yourself to be more open (no. 2, no. 23), to spot potentially useful information (no. 2), to notice when serendipity has happened (no. 29), to put yourself in potentially serendipitous situations (no. 30) and to be less scared by it (no. 4). This suggests that serendipity is less accidental than we might think (c.f. Simonton, 2003; Krotoski, 2013; Foster and Ellis, 2014). It is clear that no. 41 believed his/her experience was not quite an accident and alluded to the role of both capability and conscientious effort: “I had stumbled across something that was exciting and was by chance, almost. I’d pushed a bit harder and found it”. As no. 4 explained:

If you’re looking for information, it will be on your mind, so in some ways it’s not complete accident, so it is accident but it’s not complete. It seems random but it’s not complete random, because it’s something relevant... but it’s tricky because yes it is accident and random because... I didn’t expect to find it in the bookcase of my cousin’s shelves next to all her children’s books.

Unexpectedly, those who are less used to it, such as the man no. 4 met on a plane who “was a little bit freaked out” because it was “the first time [he’d] had this kind of coincidence”, and no. 49, who is less confident about acting on serendipity, can

experience a moment of indecision and panic where they cannot decide whether to act on the serendipity or not:

“Oh my God, shall I move you over there? That’s where I intended you to go, but you’re doing really well over there in that space”, so... and then I might have a kind of query then and “oh my God, what do I do? Cos that worked so well and I wasn’t expecting that. Do I ruin that?”

## **7.6 DOES A DESIRE FOR SERENDIPITY MOTIVATE PEOPLE TO FIND INFORMATION?**

Table 21 (p. 55) and Table 22 (p. 56) show that although 25 respondents (52%) were motivated by a specific information need for study or work, 32 (66%) responses seemed more serendipitous. As this was a question which was answered in free text and where respondents could choose more than one option, it is difficult to quantify these comments with the frequency people experience serendipity. But it seems people are looking for something: an answer to a question, new knowledge, a “lightbulb” moment, a creative idea or a meaningful conversation with other people, and it does not seem a huge leap from these comments to suggest that people are looking for serendipity, perhaps sub-consciously.

## **7.7 DOES A PREFERENCE FOR A PARTICULAR LEARNING STYLE MAKE YOU ‘SERENDIPITY-PRONE’ (MERTON AND BARBER, 2004)?**

A preference for group work and learning by doing seem to have a negative effect on serendipitous experiences (Table 23; Table 24), though the role of collaboration in serendipity has been cited by Lindsay (2013), Knudsen and Lemmergaard (2014), Cox and Ince (2015) and by respondent no. 23. One would expect a serendipitous person to prefer to study alone; be imaginative and more interested in big ideas than little details; and be flexible, open to new experiences and enjoy discovering information. However, responses to these learning styles were not overly affected by serendipity. Responses were equally spread across the very frequently, often and occasionally categories (see Table 25; Table 26; Table 27 and Appendix 2).

## **7.8 IS SERENDIPITY MORE LIKELY TO OCCUR WITH OR WITHOUT A SEARCH STRATEGY?**

The questionnaire did not show that serendipity was affected by a preference for searching for specific answers to questions (Table 28 (p. 59)). 11 (73.3%) of those who experienced serendipity often search for specific answers to questions most of the time and the respondent who almost always discovered information by accident always searched for specific answers to questions.

When it comes to searching for information for a purpose, the results were slightly more as expected (Table 29 (p. 59)). 12 (66.6%) of occasional experiencers of serendipity search for information for a purpose most of the time. This falls to 8 (53.3%) at often and 7 (50%) at very frequently. However, this downward trend was not repeated at 'sometimes' and the results at 'occasionally' and 'always' were comparable regardless of the frequency with which respondents came across information.

A tendency to plan research before starting does not seem linked to serendipity

Table 30, p. 60). 10 (55.5%) of those who occasionally experienced serendipity occasionally planned, but the majority 4 (28.6%) who planned most of the time experienced serendipity very frequently. However the respondent who almost always comes across information by accident only planned occasionally.

In Table 31 (p. 60), 12 (25%) thought it was occasionally better to find information through a planned search strategy than by accident. 3 (6.5%) thought this was never the case. Two of very frequently found information by accident and 1 came across information often. 9 (50%) of those who occasionally came across information by accident thought a planned search strategy was better most of the time. However, those who said a planned search strategy was occasionally better were across the scale of serendipitous experience. This means we cannot definitively link a dislike of search strategy to serendipity.



## 7.9 DOES FINDING INFORMATION ACCIDENTALLY BY BROWSING STILL HAPPEN? OR ARE PEOPLE MORE LIKELY, IN THIS DIGITAL AGE, TO EXPERIENCE SERENDIPITY THROUGH DIGITAL MEDIA THAN THROUGH TRADITIONAL METHODS OF INFORMATION SEEKING?

Most thought highly of the internet's role in serendipity, that it "would be difficult not to" find information unexpectedly online (no. 22). Respondents believed having access to lots of information meant you were "bound to find something" (no. 8): "engine searches can lead you to other places and give you ideas" (no. 18), "throw up some unexpected results" (no. 34), lead you to "stumble on relevant material that may have got lost in a formal search" (no. 48, no. 43) and even "lead you down a rabbit hole to something really cool" (no. 32). Google has now become a "force of habit" (no. 2): "it's easier... it doesn't take any time... it's just convenience" (no. 30). It is very easy to "follow a link" (no. 31) and "to bounce around" (no. 42). One respondent "wouldn't have followed nearly as many if it required more effort than the click of a mouse" (no. 31). However, although the internet was seen as "a fountain of serendipity[, it is] also [a] distraction. It's difficult to focus on one thing before you are swept off by some hyperlink to the next info[sic]" (no. 46).

Some put serendipitous events when using the internet down to browsing "quite a lot" (no. 25), procrastination (no. 24), social media (no. 4, no. 16, no. 36, no. 45) or just "spend[ing] too much time online" (no. 16)! Others thought it is due to "rarely hav[ing] specific questions in mind when I begin to research a subject" (no. 13) or "read[ing] widely and [being] not always focused on only one outcome" (no. 47). One commented that as s/he "only find[s] out about the subject after I have started gathering information, often the information that I find will be unexpected, or lead to unforeseen tangents, etc" (no. 13). A few people had not discovered information in this way because they were "not searching long enough or really that interested" (no. 4), had "no time to search for stuff" (no. 16) or because it "is often of not very good quality [information]" (no. 29). However, when asked which might be a better source of serendipity— Google or a database — no. 23 replied:

I would say that both could be very useful if you are in the like, I can say the serendipity mood because it seems that, you know, you get in the mood but then if your mind is open to get ideas, to get the serendipitous

mood, any database could be possibly – any library or a database could be potentially useful. Even maybe Facebook could be useful.

Google and the Internet were more popular as methods of searching for information than more traditional methods of searching that we might traditionally associate with libraries (Figure 6 (p. 61) and Table 32 (p. 62)). 46 (21.7%) cited a Google search as a means of searching for information. 19 (24.4%) chose Google as their favourite way of finding information. It was expected that this percentage would be higher, but it may be lower than expected because respondents could choose multiple options for this question. 40 (18.9%) cited the internet as a means of searching for information. Respondents liked these methods because they could access the information “without having to travel to a static library” (no. 1), for “convenience” (no. 22) and for “sparking ideas” (no 2; c.f. Heinström, 2010). Those who liked to browse bookshelves (31 (14.6%)) did so because they liked “wandering around [and] picking up books” (no. 29) and because “you can often find useful things which you weren't really looking for, which isn't the case with more specific methods of searching” (no. 35). This is similar to the open-minded “explorers” that Johnson and Walsh (2013) describe in their study. In contrast, the 30 people (14.2%) who searched databases and/or library catalogues did so for “specific information” (no. 39). Five thought it “depends on what the information is and why I need it” (no. 48). No. 25 preferred databases and library catalogues for academic work, but liked browsing bookshelves and the internet otherwise. No. 42 would ask a librarian if s/he had a general query but would use Google and browse the internet for a more detailed query. No. 43 would use Google and read articles in the absence of recommended reading from a tutor, but use Scopus for “a more niche or specific area of academic interest”.

Table 34 (p. 64) shows that, with a slight anomaly at ‘sometimes’ where 4 (26.6%) often came across information but only 3 (21.4%) very frequently came across information, you are more likely to browse bookshelves if you come across information by accident very frequently. You are also slightly more likely to browse the internet if you come across information by accident: 11 (78.6%) of those who came across information very frequently browsed the internet most of the time. This falls to 10 (66.6%) of those who often came across information by accident. 11 (61.1%) of those who occasionally came across information only sometimes browsed the internet. This suggests a link between browsing and serendipity. Table

33 (p. 63) indicates that browsing the internet was more popular than browsing the library shelves. None of the participants never browsed the internet, but 9 (18.75%) never browsed the shelves. 12 (25%) browsed the internet most of the time and only browsed the shelves occasionally. 9 (18.75%) sometimes browsed both, while 6 (12.5%) browsed both most of the time. This suggests that in the future, browsing the internet is more likely to be a source of serendipity than browsing bookshelves.

By definition, when searching for information you are looking for something specific. However browsers seemed more open to what they might find and were not looking for anything specific:

I don't often just throw something into a library search engine on the off chance that it might be relevant... I think that many people don't use library catalogues in a way they would allow them to get a serendipitous moment from it. Because they tend to be putting in specific things that they already know because they got it from a reading list, rather than just putting in a few random key words, searching for it, finding a book (no. 30).

This supports Toms (1998), whose participants were just looking for something that "leaped out" (p. 200).

Nearly all (97.9%) had discovered information accidentally when using technology. Three said this was something that happened to them all the time. Clearly serendipity can still happen in the digital age, despite the concerns of those who argue that we have lost some of the magic by our reliance on the internet, who point out the limitations of a Google search (Krotoski, 2012; Martin and Quan-House, 2013; Makri et al, 2014) and the tendency for students to search quickly, striving for an "immediate outcome" (Foster and Urquhart, 2012) and stopping searching when they have enough information for their work (Nutefall and Ryder, 2010; Williams, Rowlands and Fieldhouse, 2008). Though the internet was seen as a distraction (no. 46), most thought highly of the internet, that it would be "difficult not to" find information unexpectedly online (no. 22), that you can stumble across information online (nos. 18, 32, 34, 42, 43, 48) and that it is very easy, even effortless, to use the internet (nos. 2, 30 and 31). People like Google because it is "fast and easy" (no. 15) but the reality is "because you have to skim through a lot of material before finding the information you are searching for, and often come across another piece of interesting information along the way" (no. 38). We might think people are searching

for quick and easy answers which will make them unlikely to experience serendipity but in fact the reverse is true: their preference for Google and commitment to looking through the vast amounts of information that will be retrieved from search results makes them at least just as likely or even more likely to experience serendipity than if they had gone straight to a source.

### **7.10 CAN A LIBRARY FACILITATE SERENDIPITY? IS THERE ANYTHING A LIBRARY OR INFORMATION SERVICE COULD DO TO HELP USERS FIND INFORMATION IN THIS WAY?**

It was not expected that respondents would be so “certain” (no. 29), nor so enthusiastic about a library’s role in facilitating serendipity: “a library is a fantastic place to make unintentional discoveries” (no. 30). Interviewees referred to the layout of the library:

To get to the law section you have to walk through the history section and there’s a part where the two cross over. So sometimes you think you’re in the law section but actually you’re in the history section. So I’ve picked up quite a lot of history books that way (no. 42).

And the classification system used:

A good example is the Lower Gladstone Link in Oxford. The books are not ordered alphabetically or by specific subject [they are arranged in shelfmark order, principally by year of intake (e.g. M.98 = 1998), then by size” (Bodleian Libraries, 2015, Classification, para. 1)]. I quite often peruse the shelves and invariably find several books that I cannot resist opening. Many times I’ve been sitting with a book from my reading list and, distracted from it for a second, spotted something that sparked a new idea or direction in my work or non-academic writing and thinking (no. 30).

They suggested that a catalogue could direct a user to other useful sources by suggesting recommendations in a similar way to the targeted advertising found on websites:

People who bought this were also looking at X...the person who looked at that also looked into that it may be that you end up not having to repeat the same follow as other people, or trace the steps they made, some information that they found, for example... some sort of people who were looking for this also found that or also looked into this (no. 41).

The catalogue could ask the user:

Did you find what you were looking for?...If you didn’t, connecting you to other areas where you might get that moment of serendipity, where you find what you were looking for, essentially...if they could facilitate more avenues for the

research process, if they can point you in further directions, I would say that absolutely, it would be something that would occur more often” (no. 41).

There are, then, steps a library could take to make unexpected discoveries more likely to happen.

### **7.11 IS SERENDIPITY IN RESEARCH MORE LIKELY TO OCCUR IN AN INFORMATION-RICH ENVIRONMENT, SUCH AS A LIBRARY OR THE INTERNET?**

Respondents gave the following examples:

- an idea formed from finding an “old story” in an “old book”;
- following related links in YouTube;
- visiting an art exhibition;
- reading the newspaper;
- getting an idea for a paper when “reading a review of a play I really loved”;
- “taking a break in the library, reading old journals”.

Others gave examples that more reflected a state of mind and described their experiences in very serendipitous language. One “frequently [has] creative ideas [which] evolve using my imagination and flexibility”, another “finds patterns in things” and “often think[s] about what is happening in [their] life [and] the world and [tries] to explain them”. Another experiences serendipity frequently and when they “have an idea, everything [they] come across subsequently feeds into that idea.”

No. 29 was not intending to look at mushroom growing in the library, but it happened to turn up on the exam paper. For no. 30, it happened:

Quite accidentally in that I was on an email list and I hadn’t even read one of the emails before, I don’t think, I kept meaning to unsubscribe but I never got round to it and then this particular email came through that interested me and I ended up this last term being defined by the storytelling sessions I was attending and that’s filtered into loads of my other work.

Another time no. 30 was “just browsing Facebook” and saw “a picture of the Eiffel Tower” and was able to meet a friend in Paris, a friend who is:

From Brazil originally, we met in India, he doesn’t live in France, I don’t live in France. He was in Paris for a week, I was in Paris for a week, we overlapped and I knew that he was there because I’d seen this photograph.

As no. 41 was conducting research for his dissertation:

I received no reply from an enquiry with the local history society...I attempted to get these reports delivered from Yorkshire to the British Library in London, but there was bad weather, the archives were closed due to fire safety procedures or something so I had to go in person to visit... I unfortunately had my wallet stolen... I went to another local archive in the area which didn't have the information I sought.... I was pretty much by my last attempt [when] I visited a further local archive which contained the reports I was looking for... Basically they contradicted the results which had already been found... it seemed pretty serendipitous because *there was this chain of circumstances that led me to find these reports*... I sort of stumbled across them when doing an archive search for further information on the topic.

For no. 23, serendipity happened in a group, in a collaborative situation and not on his/her own. S/he believed there was more room for serendipity in everyday life than in academia because s/he had the opportunity to share ideas with colleagues, with whom s/he got on with “very well”, while when studying s/he was “by myself” so did not get as many “serendipitous experiences”. This supports Lindsay (2013), Knudsen and Lemmergaard (2014) and Cox and Ince (2015) who advocate the role of group work in serendipity and contradicts the indications of the questionnaire (see Table 24, p. 57). However, although many of the examples of serendipity given by respondents were in a library or information environment, this does not mean that serendipity is more likely to happen in one.

## **7.12 SERENDIPITY'S STIGMA**

The results show that 91.7% would tell others that they found information by accident, which is higher than expected. Most would not feel ashamed to tell others and did not think anyone would have any more or less respect for them if a discovery happened to be accidental. It was felt that “tutors are quite open to new, unexpected resources” (no. 21) (c.f. McCay-Peet, Toms and Kelloway's (2015)) No. 5 thought it “may help others to be curious” if they shared the information they had found. This supports the positive effect of serendipity advocated by Dantonio, Makri and Blandford (2012) and Nutefall and Ryder (2010). Most did not see the *accidental* discovery of information as a bad thing. Four referred to the role of accidental scientific discoveries: “if we didn't find information by accident, we would already have all the answers. Some of the greatest discoveries in the world have been

accidents" (no. 9). Others consider that "it is part of the learning process to find out unexpected things" (no. 47) and that there is "no reason not to tell people" (no. 13).

Six respondents were more concerned with the validity and use of the information rather than how they found it; they "care[d] more about how information is interpreted, rather than that [they] meant to find it or not" (no. 14). They commented that the information needs to be correct to be useful and must be "assessed critically" (no. 11): "finding information by accident is respected so long as some work is done applying the information in the appropriate way" (no. 35).

Unexpectedly, another pointed out that once you were presenting the information, no one would know if you had found the information accidentally:

I don't think anyone would really think about whether you had the ideas you are presenting on purpose or by accident...as long as they happened to be visible in the texts you were studying and well presented in the essay. Also, I don't know how else you would get creative ideas for an essay except by accident when you read one word and it triggers an interesting thought about what you're studying. I \*think\* that in a creative field like English it would be respected, so I would have no problem telling people about it (no. 2).

However, 15% (3/20) of arts students, 10% (1/10) of social sciences and 22.2% (4/18) of scientists thought accidental discovery was not respected in their field. These people were not only scientists (nos. 6, 19, 32 and 45): there were also musicians (no. 44), lawyers (no. 42), theologians (no. 30) and librarians (no. 10). It is not just scientists that doubt the legitimacy of serendipity in academia.

I think this is a challenging question and a fine line. Talking to academics and discussing things as found by accident is definitely acceptable in many cases. However, in writing up accounts and writing research I think serendipity is hugely underplayed...A rational and logical journey where it is possible to post-rationalise one is definitely valued above an accidental finding (no. 43).

Four (8.3%) would not tell others that a discovery was accidental. Eight (16.7%) felt serendipity was not respected in their subject. This was because scientists will "disregard" something found by accident (no. 6), because "a scientific subject...is very precise and studied, there is not much room for out of the box thinking" (no. 19), because "they want you to use their library databases which can be difficult to navigate" (no. 10), because "in science subjects, everything, [particularly] a new

finding... needs to have evidence to support it" (no. 45) or because "there's no point being competitive if no one attributes your success to you" (no. 32). Those who felt serendipity was not respected were not always unwilling to share accidental findings with others. For example, for no. 42:

Lawyers tend to be quite snobbish and see themselves as being really good at what they do, admitting to finding information by accident would undermine this. I think it's good to find information by accident and don't have a problem saying so.

Of those who thought that the accidental discovery of information was respected in their field, only 3 (11.5%) thought accidental discovery was always preferable to information found in a planned way. 11 (42.3%) thought it was sometimes the case. This shows that although serendipity is not vastly disrespected in academia, it is not very respected either. This suggests the stigma still exists, supporting Campanario (1996), Erdelez (1999), Foster and Ford (2003), Dantonio, Makri and Blandford (2012) and Foster and Ellis (2014).



## 8 CONCLUSION

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The study aimed to investigate why and how some people experience serendipity more than others. For if we understand how people find information, we as information professionals will better know how to help them.

To achieve this aim, the study sought to meet the following objectives and research questions:

### **8.1 TO EXAMINE VIA LITERATURE ANALYSIS WHAT THE CONCEPT MEANS TO RESEARCHERS AND THOSE WHO EXPERIENCE SERENDIPITY.**

#### **8.1.1 Is the description of serendipity in the literature consistent with how it is described in real life?**

Serendipity was described in the data in similar ways to the literature. Words and phrases were found in the literature and in the data collected that describe a positive, surprising experience like a “light bulb” moment (Rubin, 2010; no. 4) which came “out of the blue” (Rubin, 2010; no. 4) or which you “stumbled upon” (Bjorneborn, 2013; no. 4; no. 41). Conversely, failing to experience serendipity is described as a missed opportunity by Van Andel (1994) and serendipity lost by Barber and Fox (1958). No. 30 similarly identified the possibility of missing “non-connections”. McCay-Peet and Toms (2009) consider that serendipity can pose an unproductive diversion, but the only negativity attached to the concept in my study was that it could be scary because it was so close to what was being thought about (no. 4) or induce panic (no. 4, no. 49). It is possible to conclude then that despite serendipity being seen in both the literature and in the data as a problematic term that is hard to describe, define and understand, it is generally understood as a positive, surprising experience.

#### **8.1.2 To identify examples of literature where the characteristics and personality traits associated with serendipity are identified.**

Heinström (2006) identifies a serendipitous person as someone who is highly extroverted, highly emotionally stable, highly agreeable and highly flexible. She also considers a serendipitous person to be an open person, despite not having the evidence to support this claim. Heinström (2006) considers people to be more likely to have a serendipitous experience if they have an interest or familiarity in the topic.

Makri and Blandford (2012a) advocate the importance of being in a good mood and being relaxed with plenty of time. McBirnie (2008) and Krotoski (2012) assert that individuals must be not too busy or too focussed. Mansfield (2008) and Makri et al. (2014) state an individual must be able to seize on ideas as they arise. Serendipity might only occur after some time has passed (McCay-Peet and Toms, 2015; Csikszentmihalyi and Saywer, 1996; McCay-Peet and Toms, 2010; Makri and Blandford, 2012a; McBirnie and Urquhart, 2011; Foster and Urquhart, 2012), when you have time to be curious (Cox and Ince, 2015), in suitable places such as libraries or bookshops or in situations where you are able to think and reflect, such as washing up, or when you are “on the outlook for anything strange” (Van Andel, 1994).

## **8.2 TO EXPLORE HOW INDIVIDUALS ACROSS DIFFERENT SUBJECTS (ARTS AND SCIENCES) AND LEVELS OF STUDY EXPERIENCE SERENDIPITY.**

### **8.2.1 Are there any trends depending on the subject and/or level of study?**

As respondents were asked in free text to state the subject they were studying, it was difficult to extract this data from the survey and compare it to the frequency of serendipitous experience. The data does not show conclusively that serendipity increases with academic level. As explained in the methodology, although the doctorate sample shows an increase, the sample is too small to generalise from the data.

## **8.3 TO ESTABLISH WHETHER IT IS FELT THAT THERE IS A STIGMA ATTACHED TO FINDING INFORMATION SERENDIPITOUSLY**

### **8.3.1 Is there still a stigma around finding information by accident? Are people embarrassed by serendipity (Liestman, 1992)? Why?**

Serendipity is undervalued in science with good reason, according to Campanario (1996). Serendipity is seen to threaten reputations (Van Andel, 1994; Nutefall and Ryder, 2010; Alcock, 2010) and as a source of potential embarrassment and ridicule (Erdelez, 1999; Foster and Ford, 2003; Dantonio, Makri and Blandford, 2012; Foster and Ellis, 2014). In the study, four (8.3%) would not share their accidental discoveries, while eight (16.7%) felt serendipity was not respected in their subject. These people were not just scientists; there were musicians, librarians, theologians and lawyers as well. They felt an accidental finding would be disregarded, that there

was not room for out of the box thinking in a scientific subject, that they were expected to use library databases and that new findings need evidence to support them. However, 91.7% would tell others that they found information by accident, which suggests that serendipity does deserve the “positive stigma” advocated by Dantonio, Makri and Blandford (2012) in driving “novel research” (p. 11). Six respondents were more concerned with the validity of the information than how they found it. Most did not see the accidental discovery of information as a bad thing, citing the great discoveries that had been made this way.

#### **8.4 TO CONDUCT SIMPLE PERSONALITY TESTS TO FIND OUT IF PEOPLE THINK THEY HAVE THE SORT OF CHARACTERISTICS THE LITERATURE SUGGESTS INCREASES THE LIKELIHOOD OF EXPERIENCING SERENDIPITY (SUCH AS CURIOSITY, EXTROVERSION, SPONTANEITY, INTUITION AND CONFIDENCE) AND RELATE THESE TESTS TO THE INDIVIDUAL’S REPORTED EXPERIENCES OF SERENDIPITY AND THE FREQUENCY WITH WHICH THEY EXPERIENCE SERENDIPITY.**

##### **8.4.1 Why do some people experience serendipity more often than others? Where does the ‘knack’ for accidental discovery come from? Is there a link between personality and information seeking behaviour?**

The results show that serendipity can be linked to certain personality traits (extroversion and agreeableness) but not others (emotional stability, low levels of conscientiousness and openness to experience). However, a personality that did not fit this model did not prevent interviewees from discussing serendipity. Using personality as a predictor of information behaviour has been questioned (Heinström, 2010; Foster and Urquhart, 2012; Gleitman, Fridlund and Reisberg, 1999; Snyder, 1987). Serendipity is linked to some information behaviour (having time to search for information and to read what you find (c.f. Makri and Blandford 2012a), searching for inspiration and for new ideas, enjoy searching for information, skim-reading and a tendency not to use the first information found to save time) but not others (information literacy, interest in the subject or reading for pleasure (unlike Ross, 1999)).

##### **8.4.2 Why do people think it happens?**

Serendipity can happen both when people are in a good mood (supporting Makri and Blandford, 2012a; Csikszentmihalyi and Saywer, 1996; and McCay-Peet and Toms,

2010) and when people are feeling desperate (no. 2), frantic (no. 2), bored (no. 42), lost (no. 23), frustrated (no. 41 and 42) or terrified (no. 29). Serendipity was thought to happen because of a slow pace of life (no. 4; c.f. McBirnie, 2008), because you attract those things you are seeking to find (the law of attraction or confirmation bias), and from being in a receptive mood (no. 29), being persistent (no. 41) and having an imaginative, inquisitive approach to life with things in the back of your mind (no. 4). Respondents felt you needed to be “in the right state of being” for serendipity to happen: being relaxed, not busy and in a calm meditative state so you let serendipity happen to you (no. 4). They felt it was important not to be stressed or worried (supporting Makri and Blandford, 2012a; and Krotoski, 2012).

#### **8.4.3 Why is serendipity not always remembered?**

Everyone experiences serendipity but not everyone remembers it. You are more likely to recall instances of serendipity if it happens to you frequently. Serendipity was easily forgotten because “it’s just important for the moment, but it’s not really significant for your whole future or anything” (no. 4) or because the individual was focused at the time on something else. Sometimes it took longer to recognise the importance of an event (no. 41), which supports the ideas of Csikszentmihalyi and Saywer (1996), McCay-Peet and Toms (2010) and Makri and Blandford (2012a) that discoveries need to be thought about before serendipity occurs.

#### **8.4.4 Is serendipity something that can be learnt?**

Respondents did not generally think it was possible to look for serendipity, to “look for chance” (no. 42). However, serendipity was not thought to be entirely accidental: respondents believed it would be possible to train yourself to be more open (no. 2 and no. 23), to spot potentially useful information (no. 2), to notice when serendipity has happened (no. 29), to put yourself in potentially serendipitous situations (no. 30) and to become less scared by serendipity (no. 4). This evidence supports those who do not think serendipity is entirely accidental (Simonton, 2003; Krotoski, 2013; Foster and Ellis, 2014).

## **8.5 TO RELATE THE FINDINGS OF THIS STUDY TO THE WIDER BODY OF WORK ON SERENDIPITY**

### **8.5.1 How do people come across information serendipitously? Does a desire for serendipity motivate people to find information?**

Some respondents' motivations seemed serendipitous in that they were looking for something: an answer to a question, new knowledge, a "lightbulb" moment, a creative idea or a meaningful conversation with other people, and it does not seem a huge leap from these comments to suggest that people are looking for serendipity, perhaps sub-consciously.

### **8.5.2 Does a preference for a particular learning style make you 'serendipity-prone' (Merton and Barber, 2004)?**

The questionnaire indicated that those who experience serendipity frequently tended not to be those who enjoy learning by doing or prefer group work. However, serendipity can happen in group or collaborative work – no. 23 particularly highlighted this aspect of his/her experience. This supports Lindsay (2013), Knudsen and Lemmergaard (2014) and Cox and Ince (2015).

### **8.5.3 Is serendipity more likely to occur with or without a search strategy?**

Serendipity is not linked to either the use or absence of a search strategy.

### **8.5.4 Does finding information by browsing still happen or are people more likely, in this digital age, to experience serendipity through digital media than through traditional methods of information seeking? What methods of searching for information lead to serendipity?**

Browsing bookshelves and the internet is linked to serendipity, but the internet is more popular and may replace bookshelves over time. Serendipity can still happen in the digital age, despite the concerns of Krotoski (2012), Martin and Quan-House (2013), Makri et al (2014), Foster and Urquhart (2012), Nutefall and Ryder (2010) and Williams, Rowlands and Fieldhouse (2008). Many thought highly of the internet's role in serendipity, supporting Heinstrom (2010) and McCay-Peet, Toms and Kelloway (2015).

### **8.5.5 Can a library facilitate serendipity? Is there anything a library or information service could do to help users find information in this way?**

There are ways in which a library facilitates serendipity. Through using the library, individuals find information for one project or assignment when searching for information for other work (Makri and Blandford, 2012a), find information on return trolleys, overhear conversations, find articles left behind on photocopiers (Erdelez, 1997) and discover that a journal or database exists (Cooksey, 2004). Libraries could be arranged not by class, but by year of intake (as with the Gladstone Library, Oxford University) or by theme (as with the Warburg Institute, London). They could visually display randomly selected books electronically (as with the Bohemian Bookshelf and Blended Shelf) or suggest sources that are related to users' interests (Makri et al, 2014), perhaps with a Google-style 'I'm feeling lucky' button (Burkell, Quan-House and Rubin, 2012). The physical layout of the library could be arranged to increase the chance of accidental discovery (Knudsen and Lemmergaard, 2014; Lindsay, 2013). Interviewees were enthusiastic about a library's potential for encouraging serendipity. They referred to the layout of the library and the classification system used. They suggested a catalogue could direct a user to other useful sources by suggesting recommendations in a similar way to the targeted advertising found on websites.

### **8.5.6 Is serendipity more likely to occur in an information-rich environment, such as the library or the internet?**

It is not certain that serendipity is more likely to occur to people in a library and information environment, even though many respondents gave examples that happened in an information environment or when using technology.

## **8.6 RECOMMENDATIONS FOR FURTHER RESEARCH**

- Are we born serendipitous? Taylor (in Land and Jarman, 1992) found that nearly all children are born creative. Eighty-eight per cent of children aged 3-5 were found to be extremely divergent thinkers. By age 15, it was ten per cent. How do the remaining ten per cent retain their creativity and can we link this to serendipity?
- Which environments are more likely to support serendipity than others? Is it social media, as McCay-Peet, Toms and Kelloway's (2015) findings suggest?

- Which of Austin's four types of chance, Liestman's six approaches to serendipity and Van Andel's seventeen serendipity patterns are the most serendipitous?
- Is a eureka moment which comes out of the blue more serendipitous than confirmation of an existing theory or finding a link?
- Does confirmation bias or the law of attraction stop a finding being serendipitous?
- Is it serendipity if it happens a lot?

## 8.7 AND FINALLY...

Although scholars argue that serendipity comes about through capability, a link was not found between information literacy and serendipity. Serendipity comes from a different capability. Serendipity is like a "treasure hunt" (Heinström, 2010, p. 23), where "one clue would lead to another clue" (Nutevall and Ryder, 2010, p. 231). Serendipity is "extremely exciting and positive" where information finds you (McBirnie, 2008, p. 607). It is a "eureka moment" (Rubin, 2010; Bawden, 2011), a "windfall" (George, 2009), a "gift" (Anciaux, 1994). It makes people feel "lucky" (no. 2), "hugely relieved and pleasant" (no. 29), "very happy" (p. 23), "excited" and "rewarded with my efforts" (no. 41). It is such a "euphoric moment" (no. 49) that "it's hard not to feel something light up inside you" (no. 41). In the end, it does not seem to be learning style, information skills or really your personality that has the greatest influence on your likelihood to experience serendipity, but actually your *attitude to life*.

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## **9.1 APPENDIX 1: THE TRAVELS AND ADVENTURES OF THE THREE PRINCES OF SERENDIP, SIMONETTA TABBONI, 1557.**

“In ancient times there existed in the country of Serendip, in the Far East, a great and powerful king. He had three sons who were very dear to him. And being a good father and very concerned about their education, he decided that he had to leave them endowed not only with great power, but also with all kinds of virtues of which princes are particularly in need.”

The father searches out the best possible tutors. “And to them he entrusted the training of his sons, with the understanding that the best they could do for him was to teach them in such a way that they could be immediately recognized as his very own.”

When the tutors are pleased with the excellent progress that the three princes make in the arts and sciences they report it to the king. He however still doubts their training and summoning each in turn, declares that he will retire to the contemplative life leaving them as king. Each politely declines, affirming the father’s superior wisdom and fitness to rule.

The king is pleased, but fearing that his sons’ education may have been too sheltered and privileged, feigns anger at them for refusing the throne and sends them away from the land.

No sooner do the three princes arrive abroad than they trace clues to identify a camel they have never seen. They conclude that the camel is lame, blind in one eye, missing a tooth, carrying a pregnant woman, and bearing honey on one side and butter on the other. When they later encounter the merchant who has lost the camel, they report their observations to him. He accuses them of stealing the camel and takes them to the king and demands punishment.

The king asks how they are able to give such an accurate description of the camel if they have never seen it. It is clear from the princes’ replies that they have used small clues to infer cleverly the nature of the camel.

Grass had been eaten from the side of the road where it was less green, so the princes had inferred that the camel was blind on the other side. Because there were lumps of chewed grass on the road the size of a camel's tooth, they inferred they had fallen through the gap left by a missing tooth. The tracks showed the prints of only three feet, the fourth being dragged, indicating that the animal was lame. That butter was carried on one side of the camel and honey on the other was evident because ants had been attracted to melted butter on one side of the road and flies to spilled honey on the other.

As for the woman, one of the princes said: "I guessed that the camel must have carried a woman, because I had noticed that near the tracks where the animal had knelt down the imprint of a foot was visible. It was the imprint was of a woman's foot."

"I guessed that the same woman must have been pregnant," said another prince, "because I had noticed nearby handprints which were indicative that the woman, being pregnant, had helped herself up with her hands."

At this moment a traveller enters the scene to say that he has just found a missing camel wandering in the desert. The king spares the lives of the three princes, lavishes rich rewards on them and appoints them to be his advisors.

Taken from Sterg, 2012. Note: The 3 princes are the sons of Jafer, king of Serendip (the ancient name for Sri Lanka) ([Merton and Barber, 2004, p. 2](#)).

## 9.2 APPENDIX 2: QUESTIONNAIRE

### 9.2.1 Learning Styles

18.a. I prefer to learn by <b>seeing</b> (for example, by consulting diagrams, graphs, maps, posters and displays).	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
I like to learn in this way	1 (2.4%)	12 (28.6%)	13 (31%)	16 (38.1%)	0	42

18.b. I prefer to learn by <b>listening</b> (for example discussion, lectures, interviews and audio tapes).	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
I like to learn in this way	1 (8.3%)	6 (26.1%)	7 (30.4%)	9 (39.1%)	0	23

18.c. I prefer to learn by <b>doing</b> (for example physical activity, field trips and first-hand experience).	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
I like to learn in this way	1 (2.6%)	8 (20.5%)	13 (33.3%)	17 (43.6%)	0	39

18.d. I prefer to talk to understand new information or ideas, to work in groups and to try something first and think about it later.	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
I like to learn in this way	1 (4.8%)	6 (28.6%)	6 (28.6%)	8 (38.1%)	0	21

18.e. I prefer to study alone, to listen to others talk and think about it privately and to think about something first and try it later.	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
I like to learn in this way	1 (2.5%)	12 (30%)	14 (35%)	13 (32.5%)	0	40

18.f. I like to work towards clear goals, to take one step at a time and to focus on practical tasks.	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
I like to learn in this way	0	12 (34.1%)	12 (34.1%)	11 (31.4%)	0	35

18.g. I like reading and listening, using my imagination to solve problems and starting new projects. I am more interested in big ideas than in little details.	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
I like to learn in this way	1 (3%)	10 (30.3%)	11 (33.3%)	11 (33%)	0	33

18.h. I like to use clear thinking to work out problems, to work in a logical direction and to feel a sense of achievement.	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
I like to learn in this way	1 (2.7%)	8 (22.2%)	13 (36.1%)	14 (38.8%)	0	36



18.i. I learn by helping others and like to work in groups. I prefer tasks which have a personal connection.	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
I like to learn in this way	1 (4.2%)	4 (16.6%)	11 (45.8%)	8 (33.3%)	0	24

18.j. I tend to have a plan and stick to it. I work in a steady, orderly way.	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
I like to learn in this way	0	7 (43.8%)	5 (31.3%)	4 (25%)	0	16

18.k. I am flexible and open to new experiences in learning. I like to make choices. I work best when the work is fun and I like to discover new information.	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
I like to learn in this way	1 (2.4%)	13 (31.7%)	12 (29.3%)	15 (37%)	0	41

20.a. I know how to find the information I need	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	0	0	0	0	0
Occasionally	0	1 (7.1%)	0	0	0	1
Sometimes	0	0	4 (26.6%)	1 (5.5%)	0	5
Most of the time	1 (100%)	10 (71.4%)	11 (73.3%)	16 (88.8%)	0	38
Always	0	3 (21.4%)	0	1 (5.5%)	0	4
Totals	1	14	15	18	0	48

20.c. I like to read around my subject	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	0	0	0	0	<b>0</b>
Occasionally	0	0	1 (6.6%)	3 (16.6%)	0	<b>4</b>
Sometimes	0	6 (42.9%)	7 (46.6%)	5 (27.7%)	0	<b>18</b>
Most of the time	1 (100%)	6 (42.9%)	5 (33.3%)	4 (22.2%)	0	<b>16</b>
Always	0	2 (14.3%)	2 (13.3%)	6 (33.3%)	0	<b>10</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

20.d. I like to read for pleasure	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	0	0	0	0	<b>0</b>
Occasionally	0	1 (7.1%)	3 (33.3%)	0	0	<b>4</b>
Sometimes	1	2 (14.3%)	0	2 (11.1%)	0	<b>5</b>
Most of the time	0	4 (28.6%)	4 (26.6%)	7 (38.8%)	0	<b>15</b>
Always	0	7 (50%)	8 (53.3%)	9 (50%)	0	<b>24</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

20.e. I search for specific answers to questions	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	0	0	0	0	<b>0</b>
Occasionally	0	1 (7.1%)	1 (6.6%)	1 (5.5%)	0	<b>3</b>
Sometimes	0	6 (42.9%)	3 (20%)	7 (38.8%)	0	<b>16</b>
Most of the time	0	5 (35.7%)	11 (73.3%)	9 (50%)	0	<b>25</b>
Always	1 (100%)	2 (14.3%)	0	1 (5.5%)	0	<b>4</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

20.f. I search for information for a purpose	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	0	0	0	0	<b>0</b>
Occasionally	0	1 (7.1%)	0	1 (5.5%)	0	<b>2</b>
Sometimes	1 (100%)	4 (28.6%)	6 (40%)	5 (27.7%)	0	<b>16</b>
Most of the time	0	7 (50%)	8 (53.3%)	12 (66.6%)	0	<b>27</b>
Always	0	2 (14.3%)	1 (6.6%)	0	0	<b>3</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

20.i. I have a plan for conducting my research before I start searching	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	1 (7.1%)	0	1	0	<b>2</b>
Occasionally	1 (100%)	5 (35.7%)	5 (33.3%)	10 (55.5%)	0	<b>21</b>
Sometimes	0	2 (14.3%)	6 (40%)	3 (16.6%)	0	<b>11</b>
Most of the time	0	4 (28.6%)	4 (26.6%)	3 (16.6%)	0	<b>11</b>
Always	0	2 (14.3%)	0	1 (5.5%)	0	<b>3</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

20.j. I come across information by browsing library shelves	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	2 (14.3%)	4 (26.6%)	3 (16.6%)	0	<b>9</b>
Occasionally	1 (100%)	6 (42.9%)	4 (26.6%)	7 (38.8%)	0	<b>18</b>
Sometimes	0	3 (21.4%)	4 (26.6%)	6 (33.3%)	0	<b>13</b>
Most of the time	0	3 (21.4%)	2 (13.3%)	2 (11.1%)	0	<b>7</b>
Always	0	0	1 (6.6%)	0	0	<b>1</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

20.k. I come across information by browsing the internet	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	0	0	0	0	<b>0</b>
Occasionally	0	0	0	1 (5.5%)	0	<b>1</b>
Sometimes	0	1 (7.1%)	3 (20%)	11 (61.1%)	0	<b>15</b>
Most of the time	1	11 (78.6%)	10 (66.6%)	6 (33.3%)	0	<b>28</b>
Always	0	2 (14.3%)	2 (13.3%)	0	0	<b>4</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

20.n. I prefer to find information by visiting the library in person	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	4 (28.6%)	1 (6.6%)	1 (5.5%)	0	<b>6</b>
Occasionally	0	1 (7.1%)	5 (33.3%)	4 (22.2%)	0	<b>10</b>
Sometimes	0	6 (42.9%)	5 (33.3%)	6 (33.3%)	0	<b>17</b>
Most of the time	1 (100%)	1 (7.1%)	2 (13.3%)	6 (33.3%)	0	<b>10</b>
Always	0	2 (14.3%)	2 (13.3%)	1 (5.5%)	0	<b>5</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

20.o. I prefer to use material which is easy to access via the internet (for example by searching Google)	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	0	0	0	0	<b>0</b>
Occasionally	0	1 (7.1%)	0	2 (11.1%)	0	<b>3</b>
Sometimes	0	2 (14.3%)	4 (26.6%)	5 (27.7%)	0	<b>11</b>
Most of the time	1 (100%)	8 (57.1%)	8 (53.3%)	8 (44.4%)	0	<b>25</b>
Always	0	3 (21.4%)	3 (20%)	3 (16.6%)	0	<b>9</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

20.p. It is better to find information for my studies through a planned search strategy than by accident	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	2 (14.3%)	1 (6.6%)	0	0	<b>3</b>
Occasionally	0	4 (28.6%)	3 (20%)	5 (27.7%)	0	<b>12</b>
Sometimes	1 (100%)	5 (35.7%)	6 (40%)	3 (16.6%)	0	<b>15</b>
Most of the time	0	1 (7.1%)	5 (33.3%)	9 (50%)	0	<b>15</b>
Always	0	2 (14.3%)	0	1 (5.5%)	0	<b>3</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

20.r. I like to gather a large amount of background information before starting a piece of academic work	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	0	0	1 (5.5%)	0	<b>1</b>
Occasionally	0	4 (28.6%)	0	4 (22.2%)	0	<b>8</b>
Sometimes	0	1 (7.1%)	5 (33.3%)	2 (11.1%)	0	<b>8</b>
Most of the time	1 (100%)	4 (28.6%)	7 (46.6%)	7 (38.8%)	0	<b>19</b>
Always	0	5 (35.7%)	3 (20%)	4 (22.2%)	0	<b>12</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

20.s. A small amount of well-chosen documents is enough for each piece of work	13. How often do you discover information by accident?					
	Almost always	Very frequently	Often	Occasionally	Never	Totals
Never	0	1 (7.1%)	0	1 (5.5%)	0	<b>2</b>
Occasionally	0	4 (28.6%)	5 (33.3%)	3 (16.6%)	0	<b>12</b>
Sometimes	1 (100%)	5 (35.7%)	5 (33.3%)	8 (44.4%)	0	<b>19</b>
Most of the time	0	4 (28.6%)	4 (26.6%)	5 (27.7%)	0	<b>13</b>
Always	0	0	1 (6.6%)	1 (5.5%)	0	<b>2</b>
Totals	<b>1</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>0</b>	<b>48</b>

### 9.3 APPENDIX 3: SAMPLE QUESTIONNAIRE RESPONSE



Personality and serendipity: why do some people experience serendipity more than others?

Response ID	Completion date
57594-57588-2984592	18 Dec 2014, 14:26 (GMT)

1	I understand that my decision to participate in this study is entirely voluntary and that I am free to withdraw from the study at any time without having to give a reason.	I agree
2	How did you score on the question of emotional stability?	Just below average: a little sensitive and empathetic
3	How did you score on the question of extraversion?	Average
4	How did you score on the question of conscientiousness?	Low: quite flexible
5	How did you score on the question of agreeableness?	Extremely high: very people-minded and attentive
6	How did you score on the question of openness?	Just above average: a little original
7	Are you an undergraduate, master's or doctorate student? (If none of these, please state your level of study or your occupation.)	Undergraduate
7.a	If you selected Other, please specify:	
8	What is your age?	18-24
9	Please select a country to describe your nationality	United Kingdom
9.a	If you selected Other, please specify:	



10	What subject are you studying? (If you are not currently studying, please state what you studied at college or university.)	Theology
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11	Have you ever discovered useful, interesting, helpful or productive information you weren't looking for?	Yes
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12	Can you think of a specific example of an instance where you had a creative idea or discovered information unexpectedly?	No
12.a	If yes, please describe...	
12.b	Would you be happy to discuss your experience in more detail via a Skype interview? If yes, please provide an email address	

13	How often do you discover information by accident?	Occasionally
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14	What motivates you to find information?	If there is something I want to discuss with someone, or so that I can have a greater understanding of other people
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15	Within your subject, do you think discovering information by accident is respected?	No
15.a	Would you tell people how you found information if you found it by accident?	No
15.b	Please describe why you have answered as you have.	I feel like learning through careful analysis and a lot of time spent is respected.

16	Have you ever discovered information accidentally when using a computer, tablet, mobile or other electronic device?	Yes
16.a	If yes, please provide an example	
16.b	Why do you think you have or haven't discovered information accidentally when using electronic media?	It's very easy to click on to link after link and discover new things

17	When searching for information, I:	<ul style="list-style-type: none"> <li>• Pick up a book and follow bibliographies</li> <li>• Do a Google search</li> <li>• Talk to other people</li> </ul>
----	------------------------------------	--

17.a	If you selected Other, please specify:	
17.b	Which of these methods of information searching do you prefer and why?	I prefer talking to people as I love human interaction, but I find books are generally most useful.

Please indicate how you like to learn (please select an option for each learning style).

18	[missing question text]	
18.1	I prefer to learn by seeing (for example, by consulting diagrams, graphs, maps, posters and displays).	
18.1.a		I like to learn in this way
18.2	I prefer to learn by listening (for example discussion, lectures, interviews and audio tapes).	
18.2.a		This does not apply to me
18.3	I prefer to learn by doing (for example physical activity, field trips and first-hand experience).	
18.3.a		I like to learn in this way
18.4	I prefer to talk to understand new information or ideas, to work in groups and to try something first and think about it later.	
18.4.a		I like to learn in this way
18.5	I prefer to study alone, to listen to others talk and think about it privately and to think about something first and try it later.	
18.5.a		This does not apply to me
18.6	I like to work towards clear goals, to take one step at a time and to focus on practical tasks.	
18.6.a		This does not apply to me
18.7	I like reading and listening, using my imagination to solve problems and starting new projects. I am more interested in big ideas than in little details.	
18.7.a		I like to learn in this way
18.8	I like to use clear thinking to work out problems, to work in a logical direction and to feel a sense of achievement.	
18.8.a		I like to learn in this way
18.9	I learn by helping others and like to work in groups. I prefer tasks which have a personal connection.	
18.9.a		I like to learn in this way
18.10	I tend to have a plan and stick to it. I work in a steady, orderly way.	
18.10.a		This does not apply to me
18.11	I am flexible and open to new experiences in learning. I like to make choices. I work best when the work is fun and I like to discover new information.	
18.11.a		I like to learn in this way

19	Which of these methods of learning do you think best describes you?	i. I learn by helping others and like to work in groups. I prefer tasks which have a personal connection.
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Please read the following series of statements and indicate how much you agree with each statement on a scale from Always to Never.

20	[missing question text]	
20.1	I know how to find the information I need	
20.1.a		Most of the time
20.2	I am short of time when searching for information	
20.2.a		Most of the time
20.3	I like to read around my subject	
20.3.a		Occasionally
20.4	I like to read for pleasure	
20.4.a		Always
20.5	I search for specific answers to questions	
20.5.a		Sometimes
20.6	I search for information for a purpose	
20.6.a		Sometimes
20.7	I search for inspiration	
20.7.a		Sometimes
20.8	I search for new ideas	
20.8.a		Occasionally
20.9	I have a plan for conducting my research before I start searching	
20.9.a		Occasionally
20.10	I come across information by browsing library shelves	
20.10.a		Never
20.11	I come across information by browsing the internet	
20.11.a		Sometimes
20.12	I am willing to pay to access the information I need	
20.12.a		Occasionally
20.13	I prefer to use resources which are easy to access through my library (print or electronic)	

20.13.a		Most of the time
20.14	I prefer to find information by visiting the library in person	
20.14.a		Occasionally
20.15	I prefer to use material which is easy to access via the internet (for example by searching Google)	
20.15.a		Sometimes
20.16	It is better to find information for my studies through a planned search strategy than by accident	
20.16.a		Most of the time
20.17	I like to use the first relevant information I find since it saves time	
20.17.a		Sometimes
20.18	I like to gather a large amount of background information before starting a piece of academic work	
20.18.a		Occasionally
20.19	A small amount of well-chosen documents is enough for each piece of work	
20.19.a		Occasionally
20.20	I enjoy searching for information	
20.20.a		Never
20.21	I read a book, journal or webpage in its entirety	
20.21.a		Occasionally
20.22	I skim read	
20.22.a		Most of the time
20.23	I come across information even though I am not consciously looking for it	
20.23.a		Sometimes

#### 9.4 APPENDIX 4: COPY OF CONSENT FORM FOR INTERVIEWS

(Signed copies are not included to preserve the anonymity of respondents)



##### **Personality and serendipity: curiosity, capability and happy accidents**

This research project is being undertaken as part of a Master's in Information and Library Studies at Aberystwyth University.

I am happy to participate in an interview where I will be asked about my experience of serendipity.

I am happy for the conversation to be recorded and for a transcript of the interview to be used in the researcher's dissertation.

I understand that my anonymity will be respected and that none of my personal data (e.g. name, email address etc.) will be published.

I understand that my decision to participate in this study is entirely voluntary and that I am free to withdraw from the study at any time without having to give a reason.

Name of participant (IN BLOCK LETTERS)	Signature	Date

## 9.5 APPENDIX 5: INTERVIEW GUIDE AND TRANSCRIPT

### Interview guide

- I asked you if you could think of a specific example of an instance where you had a creative idea or discovered information unexpectedly. You said...
- How did this discovery make you feel?
- How was your mood before you made this discovery? How were you feeling?
- What were you doing at the time you made the discovery?
- Where were you?
- What had you been doing?
- When did you realise that what had happened was serendipity?
- What did you do with the information when you had discovered it?
  
- Can you recall having unexpected ideas in academic study / everyday life?  
Can you give me an example?
- In what way was this experience different to the creative ideas you have had in the course of academic study/everyday life? [Whichever you haven't already discussed.]
- How did this discovery make you feel?
- How was your mood before you made this discovery? How were you feeling?
- What were you doing at the time you made the discovery?
- Where were you?
- What had you been doing?
- When did you realise that what had happened was serendipity?
- What did you do with the information when you had discovered it?

You said you were motivated to find information by... and discover information by accident... Why do you think this is? Why do you think it happens to you?

Do you think discovering information by accident is respected in horticulture/ would be respected by friends if you told them you found something by accident?

Have you ever discovered serendipity when using a computer? Why do you think you have/haven't?

How do you like to search for information? Why method do you prefer and why?

Do you think serendipity can be learnt?

When in your research process are you at your most creative?

If you get stuck, how do you get new ideas?

How do you get diverted from what you are doing?

Do you look for serendipity?

In my survey, most people prefer using Google to find information than library catalogues. Why do you think this is?

Can a library facilitate serendipity? Is there anything a library or information service could do to help you find information in this way?

## Example interview transcript

*NB text underlined in this style indicates words used to describe serendipity.*

**Interviewer:** In the questionnaire, I asked if you could think of a specific example of an instance where you had a creative idea or discovered information unexpectedly. And you were talking about storytelling that has happened to you I guess last term? Can you tell me a bit more about that? Can you remember about that example?

Respondent no. 30: Er yeah I can, I can't remember exactly what I said. It's something that I got involved with or found out about quite accidentally in that I was on an email list and I hadn't even read one of the emails before, I don't think, I kept meaning to unsubscribe but I never got round to it and then this particular email came through that interested me and I ended up this last term being defined by the storytelling sessions I was attending and that's filtered into loads of my other work<sup>1</sup>

as well, not even just my academic work but also how I see... it's contributed in quite a big way to how I approach other writing I suppose, which is my main interest. So it's affected me beyond the academic confines... my passions, I suppose.

**Interviewer:** How did it make you feel, that discovery you had?

Respondent no. 30: At the time, it was exciting. I didn't really know what it was going to be<sup>2</sup>.

Once I had realised exactly what I was doing it was very very exciting and I started seeing how this linked to everything else<sup>3</sup> stuff I'd been doing previously and stuff I wanted to do and it sort of fitted a lot of my interests and aspirations together, both academic and outside of my studies. So it was a very exciting experience I suppose and energising.

**Interviewer:** What had you been doing at the time you made the discovery?

Respondent no. 30: I was just reading my emails, as I do a lot, and I get a lot of uninteresting emails of this type that I don't really read very much. I'm not sure, I just tend to pass over them and they don't tend to stick in my memory, so it was quite a normal situation.

**Interviewer:** What had you been doing previously?

Respondent no. 30: Goodness, I can't remember.

**Interviewer:** It's OK if you can't remember

Respondent no. 30: No, sorry, I can't remember.

**Interviewer:** OK. When did you realise that what had happened was serendipity?



Respondent no. 30: Um... I suppose not I, well I'm not sure. I'd be interested to hear what you think about this, but that's not really the point of this interview, but that the notion of serendipity and how much it is really cos this sort of thing seems to happen so reliably often<sup>4</sup> it feels like so often, for example I'm reading a book that's got nothing to do with my studies and I'll read something in it and say that's actually perfect for what I need to write an essay about tomorrow. It happens so often that it can't be luck, I don't believe in fate, so there must be an element of it's just to do with the imagination and having a lot of sources that are clustered around the same kind of ideas, I suppose. So I dunno, I probably wouldn't use the term, (would I use the term serendipity?) yeah I would use the term serendipity for it, but not in the sort of classic sense, I suppose.

**Interviewer: Can you think of another example, you say this happens to you very frequently, can you think of another time, another example you could give?**

Respondent no. 30: I discovered a very recent one... is it particularly academic stuff or?

**Interviewer: Um.. either. Academic or everyday life.**

Respondent no. 30: OK, I'll give you two, one of each. For an academic one, I got given a book over Christmas, just some collected travel writing of a journalist, not particularly academic in nature, it's not an academic, it's nothing to do with my course, I'd never read anything by him before but I discovered the book in a bookshop and thought it looked interesting. And I was shortly after Christmas I suppose the 27<sup>th</sup> or 28<sup>th</sup>, that lazy post-Christmas period and I was just starting writing an essay on - a philosophy essay, for my studies – and the extract, the section of a philosophy book by David Hume, that I'd been reading referred to at the end to an example of someone when reading fiction and not finding it as strong an experience – I'm trying not to do this in a way that's gonna necessitate explaining too much philosophy. Basically he used an example which I instinctively challenged and then I hadn't started writing the essay yet, I'd maybe only written the introduction to my essay challenging this idea, but I didn't have a lot of ammunition to challenge it and then when I read, I was just very casually, I was just having a cup of tea and I was leafing through this book and thought oh this section, when I read it, had this rather intriguing title – I wasn't thinking about my course at all<sup>5</sup> and read what he'd written and what he was talking about was his experience of reading a novel and how much belief and realism it had to him even though he was aware it was fiction and it was just this perfect counterpoint to this sort of philosophical point that David Hume had been making. And obviously it then became the centrepiece<sup>6</sup> the central piece of evidence as it were in my essay. Again, it was two sort of things that were completely unrelated: they weren't in the same book, they're not on the same syllabus, they're not in the same genre of writing, but one was extremely helpful in commenting on the other. And they happened at the same time<sup>7</sup> I was reading the

stuff for this essay the day before and then I read this bit of the book. Had I read that bit of the book two weeks before, or two weeks afterwards, it wouldn't have, I don't know whether it would've connected, it's hard to know because you don't recognise non-connections<sup>8</sup> Had I finished writing that essay, I maybe wouldn't have thought about it or had I just read it before I maybe wouldn't have thought about it when I started writing this essay.

That's one academic example. Another non-academic was when going out on a bus about three years ago. I mean it wasn't an incredible chance we met on a bus: I got on the bus, he was also on the same bus and I spoke to him because I thought he looked interesting. This was in India and we became friends, we travelled for a few days together and then parted ways but we were Facebook friends. And I had spoken to him a couple of times in the intervening years but not regularly, so I didn't know what he was doing, what he was up to generally speaking. I knew that he was still around in Europe somewhere, but we hadn't maintained close contact. And I went on Facebook, just was browsing Facebook or something and the top thing on my news feed was a picture of the Eiffel Tower and it happened that I was going to Paris a couple of days later so I contacted him and said "are you in Paris?" and he said "Yes I'm in Paris" and we were able to meet in Paris, which is quite, like he's from Brazil originally, we met in India, he doesn't live in France, I don't live in France. We was in Paris for a week, I was in Paris for a week, we overlapped and I knew that he was there because I'd seen this photograph. So that's another example of time-sensitive serendipity.

**Interviewer: OK, so in what way is that example in Paris different to the example you've just told me about your academic life? Or are they quite similar? (In terms of serendipity)**

Respondent no. 30: They're quite similar, I suppose, in that they are both time-sensitive. Like had I seen his picture after he'd been to Paris and left, it would've been interesting but I probably wouldn't've bothered contacting him and we wouldn't've met. So the end result wouldn't've happened if it hadn't've been in the right time frame. And our meeting wouldn't've happened had he been on an earlier bus or a later bus. The same with this book. I suppose in neither case was I looking for that. I didn't go on Facebook looking for someone to meet in Paris and I wasn't reading this book looking for something to write about in my essay. I was doing these things independently and the connection came out of that. The thing that interests me is why this kind of stuff happens. It's because of characteristics. The kind of book that I'm likely to read is also the kind of book that is likely to have a sort of element that might relate to my studies because I'm interested in philosophy<sup>9</sup> but not just academic philosophy – I'm interested in the whole of what you could call philosophical thinking and thoughtfulness around that kind of topic. All the books that I read are going to be in some way connected to that, even if they're travel books. Philosophy books, novels etc. So it's kind of likely they're going to link together. In the same way that the reason I met this guy was because we were both travelling,

we both travel a lot so the likelihood is at some point we were going to end up in the same place at the same time. So I suppose the characteristics of the things are what kept them closer together. It didn't necessitate these things happening, but it made it possible for them to happen.

**Interviewer: You said you were motivated to find information by a sense of narrative and that you discover information by accident very frequently. Why do you think this is?**

Respondent no. 30: Because... I think it's partly to do with curiosity and being interested in things. Partly to do with imagination and seeing links between things that you wouldn't...that other people wouldn't necessarily see the link between the two things<sup>10</sup>. So it would've been quite possible, coming back to this philosophy example, it would've been quite possible to read that and not make the connection because it's not obvious,) it wasn't absolutely obvious. It didn't say, you know, I disagree with David Hume because this, this and this – it took a bit of thinking that this is how it fits in. And I've noticed that this is something I do quite often in my essays at university which I think other people don't do as much, or not everyone does as much as I do. So perhaps I have a slightly more creative approach to making arguments, perhaps. So that might make a difference. And the narrative thing is part of that, in that that's how my imagination works – linking things together in a story. So that's how I approach any kind of situation, any kind of argument, any people that I meet. It's all about fitting it together into a story and I suppose that's one ramification of having this quite creative imagination, I suppose.

**Interviewer: Do you think serendipity can be learnt?**

Respondent no. 30: Yes, not directly. But you can learn to put yourself in situations and put yourself in the mindset that allows you to have serendipitous connections with things. Yes. So by exposing yourself to lots of different stimuluses, to meeting lots of people, the chances are the more resources that you have got going, the more stimulus you have coming in, the more likely you are to have two different things that connect.

**Interviewer: When in your academic study, in your research for a paper you've got to do, are you at your most creative?**

Respondent no. 30: At what stage in the process?

**Interviewer: Yeah, at what stage in doing something.**

Respondent no. 30: Often when I start writing is a good moment. A lot of ideas come to me when I'm actually writing. Somehow it's sort of I've read lots and lots of stuff but I haven't got a clear argument. When I sit down and write that's when I can bring it all together and then add my own ideas into it and have that kind of creative moment. So yeah probably quite a late stage, in that sense. Yeah, at that late stage rather than at the outset. I don't have amazing creative ideas as soon as someone

poses the question. I go away and I work it out. I read stuff, like maybe have a serendipitous experience, maybe read something bizarre and that fits into it. It's when I actually sit down and write that it actually comes together, weave the whole thing into a creative piece. Be it fiction or journalism or academic work.

**Interviewer: If you get stuck in the process, how do you get new ideas? How do you move forward?**

Respondent no. 30: Partly go away and try again. Sort of just leave it and go away and come back to it, come back to writing and just seeing if it works. Or changing to something new. So if I'm reading a document, an article say and it not particularly interesting or I'm reading a book and it's not particularly interesting, not particularly stimulating, I'll change and do something else. Dip my fingers in something else and see if I can get anything from that. I won't usually sort of plough on through stuff. I suppose I'm quite flighty in that I'll easily change from one resource to another. Or I'll try and find some alternative media like watch a video on it or ask someone about it if I'm not sure like I'll email a friend who I know is knowledgeable about that particular area and ask them what they think and see if they can point me in different directions. Gaining some different stimulus would be my go to solution.

**Interviewer: Sometimes serendipity is described as a diversion in that it will take you away from what you were doing at the time or what you were planning to be doing. How do you get diverted? How does that happen to you?**

Respondent no. 30: I feel I don't get that diverted because I tend to use... I make a big effort to kind of bring it back to what I was originally doing. I don't think serendipity often takes me somewhere I wouldn't've gone otherwise, it just helps me get there or it gives me a boost to get there.

[pause]

**Interviewer: Sorry, I lost you for a second. So it's a boost?**

Respondent no. 30: So going back to the first example, it's a good example. So I was interested in stories and storytelling. I was interested in the sorts of areas that this was in, that's why I took up the experience in the first place. I had to read the right email, apply for the right thing, but once I read it I knew that it was something I was interested in doing. So there were interests that were already there, but it gave me a really significant boost in that direction. The same with this example of the book I was reading, you know, the argument, the idea I had was there in my head, the serendipitous moment just allowed me to take it further, to make a better point out of it, to elaborate. So even when it would be particularly diverting, it strengthens the cause – whatever I'm working towards at the time.

**Interviewer: Are you looking for serendipity, do you think?**

Respondent no. 30: Not really no. No I'm not expecting to find it. I'm never that surprised because it tends to happen quite often. I'm not consciously thinking "I hope I find something in this unlikely looking place, it's gonna really give my ideas a boost", you know?"<sup>11</sup>

**Interviewer: In the survey most people prefer using Google to using a library catalogue or a database or something like that. Why do you think that is?**

Respondent no. 30: Why do people prefer Google?

**Interviewer: Yeah.**

Respondent no. 30: It's easier. It's a bit of a pain to go to a library catalogue, you have to like go and find the book before you can find out any more about it, whereas Google you can get quite a large sample often. And then if you decide it's not relevant it doesn't take any time, you know? If you click on a Wikipedia page or something like that you can look into it or you can look down Google and you can see "that's not relevant, that's not relevant but this might be relevant" whereas with a library catalogue because you get less information normally on what the book is, what the article is about. It's a less deep survey of what's there. Also probably because people are using the internet all the time. Like most people work on their laptops, most people browse stuff on their phones or their tablets or whatever. So it's just convenience because it's already there. Yeah, I know you can use library catalogues online but you only do that when you're actually after work and I don't often just throw something into a library search engine on the off chance that it might be relevant because when I'm looking for a book, I'll just look for something from my reading list. It's things from outside that I get more randomly.

**Interviewer: OK so would Google be do you think, be more likely to result in serendipity?**

Respondent no. 30: I think so. Or maybe not? It's just that I don't use library catalogues, I don't think that many people don't use library catalogues in a way they would allow them to get a serendipitous moment from it. Because they tend to be putting in specific things that they already know because they got it from a reading list, rather than just putting in a few random key words, searching for it, finding a book. I mean, that's just my experience, I haven't done a huge amount of original research, I'm mostly doing stuff that is a reading list, a set essay, so it's a little bit more predictable what stuff, what the sort of main academic literature is. So the serendipity comes – not the garnish, necessarily, but the elaboration of that – the cause, the academic stuff, which I don't get from solo [catalogue] or whatever.

**Interviewer: So is there anything else you'd like to share about serendipity? That we haven't already talked about?**

Respondent no. 30: Not immediately, no.

**Interviewer: OK. Well thank you very much for your time, in that case.**

Respondent no. 30: It was a pleasure talking to you. All the best.

**Interviewer: OK Bye**

Respondent no. 30: Bye.

*Then I asked after the interview, one last forgotten question (by email):*

**Can a library facilitate serendipity? Is there anything a library or information service could do to help you find information in this way?**

Absolutely! A library is a fantastic place to make unintentional discoveries. A good example is the Lower Gladstone Link in Oxford. The books are not ordered alphabetically or by specific subject. I quite often peruse the shelves and invariably find several books that I cannot resist opening. Many times I've been sitting with a book from my reading list and, distracted from it for a second, spotted something that sparked a new idea or direction in my work or non-academic writing and thinking<sup>12</sup>. I have had this experience in many libraries - it is what has nurtured an academic and artistic interest in the philosophical debates surrounding dementia, as well as fed a keen interest in Michel Foucault.

The books in the Lower Gladstone Link are, as I mentioned, not strictly ordered. Nonetheless, there is a general theme: most books fall under the wide category of 'the humanities' - there isn't any string theory or physical geography, for example. This helps when it comes to 'randomly' finding books one would want to read, as a large percentage are not particularly esoteric, or if they are they remain accessible e.g. a book about dissident writers in Central-East Europe. This is also the kind of area in which I am interested. I have spoken to friends who have not found the same as me - so might conclude that my inquisitiveness (academically I am the quintessential 'jack of all trades but master of none') is a major factor.

*(NB Bodleian Library material in the Gladstone Link is arranged in shelfmark order, principally by year of intake (e.g. M.98 = 1998), then by size.*

<http://www.bodleian.ox.ac.uk/bodley/finding-resources/rooms/gladstone-link>

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<sup>1</sup> It happens by accident. S/he doesn't normally read these emails, but just happened to this time (this makes it even more significant) – and then it has an effect beyond that instance. I wonder what made s/he read it that particular time? Maybe something just caught their eye.

<sup>2</sup> If we knew it would stop being a surprise.

<sup>3</sup> Serendipity has to be meaningful. It can't exist in a vacuum.

<sup>4</sup> Is it serendipity if it happens a lot?

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<sup>5</sup> Typical conditions for serendipity: wasn't thinking about it at the time, casually "leafing" through the book, relaxed, "lazy post-Christmas period" having a cup of tea

<sup>6</sup> Significance of experience

<sup>7</sup> This was fortuitous because if s/he had read it sooner or later, the outcome would probably have been different.

<sup>8</sup> Missed opportunities, negative serendipity, serendipity lost, what could've been

<sup>9</sup> Need to be interested in it, to be reading around it, to be thinking about it. If you take an approach where you think "oh I'm just going to quickly find something for this boring assignment, that will do, end of" – that is much less likely to lead to these unexpected events.

<sup>10</sup> It needs to be significant to the individual.

<sup>11</sup> In contrast to the people desperately hoping to find something soon.

<sup>12</sup> Libraries not arranged by one of the traditional classification systems can create the random discovery needed for serendipity.